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THE IRON TRADE REVIEW

A Weekly Journal Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

VOLUME XXXVII CLEVELAND, OHIO, SEPTEMBER 22, 1904 NUMBER 38

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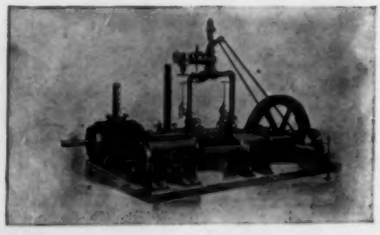

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THE IRON TRADE REVIEW

VOLUME XXXVII CLEVELAND, OHIO, SEPTEMBER 22, 1904 NUMBER 38

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The reductions by the billet and bar pools on Monday complete the readjustment of the steel market commenced early this month, when reductions were made by the beam and plate pools. Whether the reduction on billets will stimulate buying, it is too early to predict, and the reduction on bars is not sufficient to affect present demand to any great extent. The reduction on billets is $3.50 a ton, making the new Pittsburg base $19.50, but owing to a revision of the delivered schedule by which the actual freight is added to the point of consumption, the reduction at distant delivered points is not so great, as the mills heretofore absorbed a portion of the freight. By this new arrangement the reduction to Chicago consumers is only $1.50, Cleveland $2.60, New York $2.65, Philadelphia $2.85 and New England points $2.25. Not since 1900 have billets been on as low a basis, when sales were made at $17.50, Pittsburg, and in November of that year the billet pool established a minimum of $19.75. This reduction will affect only a small tonnage of the billet consumption, as the United States Steel Corporation and other large interests aim to market their product in a more highly finished form, while most of the large outside consumers of billets have been practically securing this reduced price for months on sliding scale contracts. The pool remains intact so far as former membership is concerned, and the co-operation of the Lackawanna Steel Co. has been secured in maintaining pool prices. The privilege of interchanging steel among pool members at inside prices is an inducement for small independent mills to continue their affiliations, as they are thus insured a supply of steel for finishing departments which they may have, provided their steel capacity is inadequate, at prices they could not otherwise secure. The reduction on the steel bar card is $1 a ton, or to 1.30c, Pittsburg. Practically all of the existing contracts were made on this basis early in the year before the advance to 1.35c was made, and as bar prices have been guaranteed, the undelivered tonnage placed at 1.35c will have the advantage of this reduction. This reduction also applies to light zees, tees, angles, channels and tire steel. On sheet and tin bars the reduction is only $2.50, or to $21.50, Pittsburg. The spread between billets and bars has been increased from $1 to $2, and, as on billets, the reduction at distant delivered points is not as great as at Pittsburg.

The decision of the Republic Iron & Steel Co. to erect additional finishing capacity at Youngstown is of the utmost interest to the trade. It is reported that structural shapes will be rolled and a sheet bar mill may be added. Since the completion of additions to its Bessemer department last year, its steel producing capacity has exceeded the demands of its finishing departments, and this surplus steel has been marketed in the form of billets.

It is now about three weeks since the readjustment of prices on finished lines, completed this week, was begun. The radical reduction on tin plate has not increased consumption and the deep cut into the prices of wire products has brought out only a seasonable demand. On merchant pipe, with prices lower than they have been in years, shading is reported, and the demand is far below what is expected at this season. The reduction on sheet bars was discounted by the sheet mills, desirable orders having been taken for several weeks at 2c for 28 gauge, and the buying is not yet up to normal. The reductions on structural shapes and plates have had little effect on demand.

Pittsburg reports a better demand for pig iron, two sales aggregating 10,000 tons for delivery the last quarter having been made, and two inquiries for 7,500 and 2,500 tons, respectively. In other cities the demand for Northern iron has increased, but there is no great forward buying. There is no improvement in foundry iron prices and the slightly better demand is not regarded as significant of improved prospects, since all iron men pin their expectations to 1905 and do not count a great deal on the remainder of this year. Southern iron is rather weaker, sales having been reported as low as $9, although sales are still made as high as $9.50.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
439 PARK BUILDING, Sept. 21.

At meetings of the billet and merchant bar associations held here at the Union Club on Monday, the base price of billets was reduced from $23 to $19.50, sheet and tin bars from $24 to $21.50, and the entire bar schedule was reduced $1 a ton. The reduction on billets and tin and sheet bars while amounting to $3.50 and $2.50 a ton respectively at mill, Pittsburg, is much less at distant delivered points owing to the withdrawal of the former delivered prices which absorbed a large portion of the freight. The new agreement provides for the addition of the actual freight from Pittsburg, and while Wheeling and Youngstown take the same basis as Pittsburg, shipments from these points take the freight from Pittsburg to point of delivery. According to the former schedule the Chicago delivered price was only one dollar above the base, but inasmuch as the actual freight is $3, the reduction to Chicago consumers is only $1.50 a ton on billets and $0.50 on sheet and tin bars. The Cleveland delivered price was 50 cents above base, but as the freight is $1.40, the reduction to consumers at that point is only $2.60 on billets. The previous schedule also absorbed 75 cents of the freight to New England points, 85 cents to New York and $1.15 to Philadelphia. The spread between billets and sheet and tin bars has been increased from $1 to $2 a ton. This action was anticipated, inasmuch as the mills producing bars for the general trade have the situation well in hand and can enforce the increased differential without danger of outside competition. Wheeling and Youngstown are the only points that now have the same base as Pittsburg—Ashland, Johnstown, Lorain and Ironton being eliminated in the new agreement. The announcement that the Lackawanna Steel Co. is a new member to the agreement is of interest, although not yet rolling billets for the market. While this concern was considered as a possible disturbing factor in rails, plates, structural material and billets earlier in the year, such danger is passed, it now being affiliated with these various associations and pools. Monday's meeting was well attended, and while several interests repre-

sented favored a still greater reduction, the action taken was in the nature of a compromise. The reduction of $1 throughout the bar schedule is of little importance. Practically all of the bars that are being delivered are on the 1.30c basis, the mills having allowed consumers to come in at that price last spring before the advance of $1 a ton was announced. The few that contracted for their material on the advanced basis will secure the remainder of the tonnage on their contract at the reduced price, as bar prices are guaranteed.

The Republic Iron & Steel Co. will increase its finishing capacity at Youngstown, it is reported, by the addition of a structural mill and may later become a producer of sheet bars. Since the completion of additions to its Bessemer department it has had a large surplus tonnage of steel which has been offered on the market in the form of billets and slabs, and the new finishing departments will have almost sufficient capacity to consume this surplus. About a year ago there were rumors that this company would build a rail mill, and while no definite announcement has been made, it can be stated on authority that no rail mill will be built at present or in the immediate future.

As previously noted, two orders for plates for lake vessels were placed last week, one order going to a local concern and another being received by the Cambria Steel Co. About 5,000 tons will be required. Thus far plates for three lake ships have been ordered, showing a slight revival in lake shipbuilding after an extended quiet period. Otherwise the market remains quiet, the recent reduction not yet having had the stimulating effect expected. Demand for sheets and wire products is seasonably heavy, but there is little demand for tin plate, while merchant pipe is quiet despite the fact that a big buying movement is always expected at this season of the year.

The pig iron market has been more active than for some time, the sales of the week aggregating 10,000 tons of foundry and forge iron. Inquiries are out today for an additional tonnage amounting to nearly 10,000 tons, large consumers covering for delivery through the last quarter. Prices have not been stimulated by this buying movement and so far as the Southern market is concerned, lower prices are expected owing to the blowing in of so much idle capacity.

Pig Iron.—The Westinghouse Electric & Mfg. Co. last week purchased 8,000 tons of foundry iron for delivery to its Allegheny and Cleveland plants. Seven thousand tons went to Northern furnaces while 1,000 went to Southern operators. On the Southern iron, contracts were closed at $9 and $9.25, for delivery the remainder of the year, these prices being made despite the quotations of the majority of the Southern stacks that are holding firm at $9.50 for No. 2. The iron for the Cleveland plant was divided between two furnaces at that place at prices approximating $12.35. For Allegheny delivery about $12.60 was done. The National Tube Co. also purchased 2,500 tons of forge, largely Southern, which was sold on the basis of $8.75, Birmingham. This week the Westinghouse Air Brake Co. is in the market for 2,000 tons of foundry iron, while the Standard Sanitary Mfg. Co. is in the market for 7,500 tons of foundry and forge iron for its various plants for delivery the last quarter. Bessemer iron for prompt delivery can be had at $11.75, Valley furnace, while on forge iron the outside price is $11.85, Pittsburg. On Northern No. 2 Foundry $12.50 can be done for prompt shipment. We revise quotations as follows:

Bessemer, Valley	$11 75 to 11 90
Bessemer, Pittsburg	12 60 to 12 75
No. 1 Foundry	13 00 to 13 25
No. 2 Foundry	12 50 to 12 85
Gray forge, Pittsburg	11 75 to 11 85
Chilled basic, Valley	11 65 to 11 75
Chilled basic, Pittsburg	12 50 to 12 60

Steel.—At a meeting of the billet association held here on Monday, Sept. 19, a $3.50 reduction was made on 4 x 4 billets on a Pittsburg basis, while the reduction on sheet and tie bars is only $2.50, the spread between the two having been increased from $1 to $2 a ton. This action was expected, as there are no large producers outside of the Carnegie Steel Co., Jones & Laughlin Steel Co. and the Sharon Steel Hoop Co., and the market can be maintained without difficulty. Instead of absorbing a portion of the freight as heretofore, quotations are made f. o. b. mill, Pittsburg, plus the actual freight to the point of destination. As a result of this new arrangement, the reduction on billets and bars at such centers as Chicago, Cleveland, New York and Philadelphia is not as large as at Pittsburg. This is more clearly shown by the following table:

	Old Price.	New Price.	Freight.	Reduction.
Chicago	$24.00	$22.50	$3.00	$1.50
Cleveland	23.50	20.90	1.40	2.60
New York	24.75	22.10	2.60	2.65
Philadelphia	24.75	21.90	2.40	2.85
New England Points	25.25	22.50	3.00	2.25
Pittsburg, f. o. b. mill	23.00	19.50		3.50

While Youngstown and Wheeling take the Pittsburg base, shipments from these points must include the freight from Pittsburg. Despite this rearrangement, delivered prices are to be quoted as heretofore, a uniform list to be used by all producers being now in preparation. At this meeting the Lackawanna Steel Co. became a member of the association, the only steel producer of prominence now outside being the Ashland Steel Co., of Ashland, Ky. There were no withdrawals from the association despite reports to the contrary, all of the smaller members continuing as members and abiding by the new agreement. Furthermore it is to the advantage of these mills to continue their membership, as one of the many benefits to be derived therefrom is an interchange of steel only possible among association members at an inside price. In this way, small mills whose finishing capacity should at any time exceed the steel producing capacity can secure material from any of the association members at a price several dollars a ton below the prevailing market price. The reduction on billets and bars affects the steel corporation very little, as its tonnage sold in the open market is only a small portion of its entire production. We revise quotations as follows: Bessemer and open-hearth billets, 4 x 4 inches and slabs, up to and including 0.25 carbon, $19.50, f. o. b. mill, Pittsburg, Wheeling or Youngstown, with actual freight added to point of delivery from Pittsburg; 0.26 and including 0.60 carbon $1 advance; 0.61 to 1.00 carbon $2 advance. Billets smaller than 4 x 4 inches, $2 advance; sheet and tin bars $2 advance. Bessemer and open-hearth rods are held at $25 to $25.50.

Ferro-Manganese.—Demand for ferro continues light and low prices continue to prevail. We quote domestic ferro, 80 percent in carload lots at $41, delivered at buyer's mill at any point east of the Mississippi.

Muck Bar.—The market continues quiet, neutral bars being held nominally $24.50, Pittsburg.

Skelp.—There has been considerable buying of iron skelp, although prices have not stiffened to any extent. We quote grooved steel skelp at 1.25c and sheared at 1.30c to 1.35c. Grooved iron is held at 1.40c and sheared at 1.45c to 1.47½c.

Rails and Track Material.—Reports of rail contracts for delivery next year are entirely premature, although it is probable that a meeting of the rail manufacturers will be held some time next month for the purpose of fixing the schedule for 1905. Somewhat better prices are prevailing on light rails, although competition continues keen. We revise quotations as follows: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 to 40 pounds, $20 to $21. Spikes, 1.55c to 1.60c.

Plates.—The Jones & Laughlin Steel Co. and the Cambria Steel Co. have received contracts for the plates for two new lake vessels. In each case about 2,500 tons are required. Thus far this month plates have been purchased for three ships that are to be built at lake shipyards this fall. We make the following quotations: Tank plate, ¼ inch thick, 6¼ to 24 inches, incl., 1.30c f. o. b. mill, Pittsburg; over 24 inches up to 100 inches, 1.40c. Extras are as follows per pound: Flange and boiler steel, .10c; marine, A. B. M. A., and ordinary fire box, .20c; still bottom, .30c; locomotive fire box, .50c; plates over 100 inches up to 110 inches in width, not less than 5c per 100 lb. extra; plates 110 inches to 115 inches wide not less than 10c extra; 115 to 120 inches, 15c extra; plates 120 inches to 125 inches wide, not less than 25c extra; plates 125 inches to 130 inches, not less than 50c extra; plates 130 inches wide, not less than $1 extra; plates 3-16 inch thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Structural Material.—The American Bridge Co. received the contract for a large power plant in New York calling for 10,000 tons. The McClintic-Marshall Construction Co. was also awarded a contract this week for the steel for repair shops for the B. R. & P. railroad amounting to about 700 tons. Specifications on structural shapes are being received more freely and most of the mills are operating in full. We make the following quotations: Beams and channels, up to 15 inches, 1.40c; over 15 inches, 1.50c; angles, 3 x 2 up to 6 x 6, 1.40c; zees, 1.40c; tees, 1.45c; angles, from 3 to 16 inches, 1.40c; universal and sheared plates, 6¼ to 24 inches incl., 1.30c; over 24 inches, 1.40c base.

Bars.—At a meeting of the merchant bar association held in this city on Monday, the entire bar schedule was reduced $1 a ton. This places steel bars on the basis of 1.30c, which really amounts to no reduction at all, as the contracts made last spring were on this basis and will not expire for six months. Consumers contracting on the basis of 1.35c will get the advantage of this reduction on the tonnage not yet delivered, as quotations were guaranteed against decline. This puts bars back to the basis fixed last November when a reduction of $6 a ton was made. We revise quotations as follows: Bar iron, 1.25c to 1.30c, Pittsburg; hoops, 1.55c, and bands 1.35c, both taking bar extras. Bessemer and open-hearth steel bars, 1.30c; plow and cultivator beams, 1.30c, net; channels, angles, zees and tees, under 3 inches, 1.40c; the following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance.

Sheets.—The reduction on sheet bars has already been discounted by the mills that have been selling on the basis of 2c for 28 gauge. This price will only be done however on desirable orders, otherwise 2.10c is quoted. Demand is better than at any time this year and a majority of the mills are operating in full. On lots amounting to 25 bundles and over the leading interest is quoting on the 2.10c basis for No. 28, while the independent manufacturers will not do this except on carload lots. We make the following quotations on black sheets, 25 bundles and over: No. 8, 1.60c; No. 9, 1.56c; Nos. 12 to 14, 1.70c; Nos. 15-17, 1.75c to 1.80c; Nos. 18-21, 1.85c to 1.90c; Nos. 22-24, 1.95c; Nos. 25-26, 2c; No. 27, 2.05c; No. 28, 2.10c to 2.15c; No. 29, 2.35c to 2.40c; No. 30, 2.50c to 2.55c; Galvanized: Nos. 12-17, 2.20c to 2.25c; Nos. 18-21, 2.35c to 2.40c; Nos. 22-24, 2.50c to 2.55c; Nos. 25-26, 2.65c to 2.70c; No. 7, 2.90c; No. 28, 3.10c; No. 29, 3.45c to 3.50c; No. 30, 3.85c to 3.90c.

Wire and Wire Nails.—Demand continues heavy, additional departments having been placed in operation at South Sharon this week. We make the following quotations: Wire nails, jobbers' carload lots, $1.60; retailers' carloads, $1.65, and less than carloads, $1.75; painted barb wire, $1.75 to jobbers in carloads; retailers' carloads, $1.80, and less than carloads, $1.90, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.45, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron and steel cut nails are held at $1.65 to $1.70.

Merchant Steel.—Demand for merchant material is heavier, the reduction on the merchant bar card only affecting tire steel which is off $1 a ton. We revise quotations as follows: Toe calk, 1.90c; carriage spring steel, 1.75c; tire steel, 1.50c to 1.55c; plow steel, 6 inches and under, 1.35c for Bessemer and open-hearth; plow slabs, ¼ inch and heavier, 1.60c. Drawn and cold rolled shafting is held at 52 percent off in carload lots and 47 off in less than carload lots.

Pipes and Tubes.—Demand for merchant pipe continues light for this season of the year and the regular card rate is being shaded one point by some of the independent mills. Nearly all of the mills are working on large orders of line pipe which makes up to some extent the falling off in the tonnage of merchant pipe. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	71	55	69	53
⅜ and ½ inch	75	63	73	61
¾ to 6 inches	79	69	77½	67½
7 to 12 inches	74	59	72½	57

Extra Strong Plain Ends.

⅛ to ⅜ inch	64	52	62	50
½ to 4 inches	71	59	69	57
4½ to 8 inches	67	55	65	53
Double extra strong plain ends, ½ to 8 inches	60	49	58	47

MERCHANT BOILER TUBES, LESS CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inch	48	42
1¾ to 2¼ inches	60	42
2½ inches	62	48
2¾ to 5 inches	68	55
6 to 13 inches	60	48

Old Material.—The movement of old material, despite the resumption of a number of steel mills continues light. Foundries are buying only for immediate shipment and the entire movement of old material is to cover immediate requirements only. Heavy melting stock continues to be held at $12 to $12.50. We make the following quotations, gross tons: Re-rolling rails, $12 to $12.50; re-melting rails, $11.50 to $12; low phosphorus melting stock, $15 to $15.50; sheet scrap, $9 to $9.50; No. 1 wrought, $12 to $12.50; cast iron borings, $6 to $6.50; No. 1 cast, $10 to $10.50.

Coke.—The H. C. Frick Coke Co. is now operating 88 percent of its ovens in the Connellsville region and is also buying coke in the open market to some extent. Prices to independent producers have not improved materially, however, and are held at $1.35 to $1.40 for furnace coke, while foundry coke is quoted at $1.75 to $1.85. The H. C. Frick Coke Co. expects to have 200 of its new ovens in the upper Connellsville basin in operation early in November, while the remaining 800 ovens under construction will be completed early next year. For the week ending Sept. 10, the production of the upper region amounted to 194,761 tons and the lower 58,200 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Sept. 20.

The insufficiency of the $4 cut in structurals and plates is more clearly seen now than it was a week ago, especially in the case of the former. On every hand, buyers and sellers express their dissatisfaction with the new prices of these materials, and except for immediate needs, consumers are withholding their specifications almost to the same extent as before the change. The opinion is freely expressed that the Association in only partly meeting the views of the trade in the reduction that was considered necessary as a stimulant to consumption, has served to retard rather than to improve the buying impulse. Only a moderate tonnage has been placed with mills in the week under review; and on the lighter structural shapes independent producers have secured the greater part of the tonnage offered by bidding slightly below pool prices.

Bar iron has advanced $1 a ton since our last report, and is now quoted by the leading manufacturer at $1.40c Chicago. This step has been expected for some time, owing to the high prices at which dealers have been holding their scrap, which have been out of proportion to the price manufacturers were able to get for the finished material. New tonnage continues to come forward in good volume, and mills have plenty of business on their books. Specifications for steel bars and merchant shapes are also good, the agricultural implement trade sending in full quotas against their contracts. Considerable cutting of prices is being done on hard steel angles rolled from old rails, as low as 1.20c being made. Sheets are enjoying good movement, though some interests still find it necessary to shade prices to attract business. Tubular goods are active, many jobbers having sent in good sized specifications since the recent readjustment of prices. Light rails are firm and in brisk demand, as also are track supplies. Railroads are apathetic in the matter of specifying for heavy sections, and the season for building new track being nearly over, it is not expected there will be much further activity in this department until after the meeting of the rail pool next month to consider prices for the coming year. Producers of wire products report a continuance of the heavy demand that has been felt since the new schedule of prices was issued, jobbers everywhere laying in large fall and winter stocks. Mills are still unable to keep pace with the demands for prompt shipment, and are dividing their output to meet the most pressing wants.

Coke is in fair demand and shows signs of increasing strength. Producers are declining to sell far ahead at present prices, insisting on prompt shipment or a higher price for future deliveries.

Pig Iron.—Evidences are not wanting to prove that pig iron is growing stronger day by day. Consumption is increasing and the inquiry for new tonnage grows heavier; while business placed is limited in many instances only by the capacity of the furnace or its desire to sell ahead. The rapid depletion of Southern stocks and the continuance of the coal miners' strike resulting in the suspension of more than two-thirds the productive capacity, has greatly strengthened Southern irons, and predictions that $12 Birmingham for No. 2 will again be realized within a few months are made in some quarters. Furnaces with iron to offer are cautious in their sales, declining to sell lots greater than will satisfy current needs of melters or for deliveries extending beyond the present year. Some No. 2 iron is still being offered in this market at $9.25 Birmingham, including the product of the new furnace in Alabama, which recently went into blast, although, it is proper to state as an offset to this low priced iron that some furnaces are asking $9.75 Birmingham for their product. These, however, are not selling very much tonnage, if any. Northern furnaces have booked the greater portion of the tonnage offered in this market during the week under review, several contracts calling for deliveries as far ahead as May, 1905. On all iron for delivery in the new year, local producers are asking on the basis of $14 a ton for No. 2, maintaining $13.50 as the absolute minimum for this year's delivery. The transactions in the past week have included tonnages ranging from 2,500 tons down. There was some demand for malleable iron, a number of melters making season contracts. This product shows increasing strength, and is now quoted $13.75 to $14. Our quotations follow:

Lake Superior Charcoal	$ 15 00
Northern Coke Foundry No. 1	14 00
Northern Coke Foundry No. 2	13 50
Northern Coke Foundry No. 3	13 00
Northern Scotch Foundry	15 00 to 15 50
Ohio Strong Softeners No. 1	14 50 to 15 00
Ohio Strong Softeners No. 2	14 00 to 14 50
Southern Coke Foundry No. 1	13 65
Southern Coke Foundry No. 2	13 15
Southern Coke Foundry No. 3	12 90
Southern Coke Foundry No. 4	12 65
Southern No. 1 Soft	13 65
Southern No. 2 Soft	13 15
Southern Gray Forge	12 65
Southern Mottled	12 40
Southern Silveries (4% to 6% Silicon)	14 85 to 15 85
Jackson Co. Silveries (8% to 10% Silicon)	17 80 to 18 30
Alabama and Georgia Car Wheel	18 85 to 19 35
Malleable Bessemer	13 75 to 14 00
Alabama Basic	13 15 to 13 40

Billets.—The action of the billet pool is awaited with much interest in this market. Few, if any consumers are covering for their wants because of the uncertainty regarding prices, and little buying will be done until after the results of the meeting are known. Although "official" prices can be shaded, we continue to quote them as a basis: Bessemer and open-hearth billets, 4 x 4 and larger, up to .25 carbon, $24; up to and including .60 carbon, $1 extra. Billets, 3⅞ inches and smaller, and sheet and tin bars, $25. Wire rods, $28 to $29.

Bars.—The local producer has advanced its prices on bar iron $1 a ton, and is now asking 1.40c Chicago for car lots and greater. A fair demand has been felt during the week under review, though the tonnage coming forward is yet far from what might be considered satisfactory. The situation with regard to steel bars is unchanged, many consuming interests awaiting to see what action will be taken at the meeting of the association to be held this week in regard to reduced prices before specifying very heavily. A good tonnage continues to come forward, however, despite the uncertainty existing, and a definite announcement as to what will or will not be done in the matter of prices will do much towards improving the local trade. There is a fair demand for hoops and angles, though on hard steel angles, rolled from old rails, some low prices are being made. We quote iron bars, 1.40c Chicago; soft steel bars, 1.40c to 1.51½c; soft steel angles, less than 3 x 3, 1.61½c; hoops, 1.71½c. On small lots from store, we quote bar iron, 1.75c base, full extras; steel bars, 1.70c to 1.80c base, half extras; hoops, 2.10c rates full extras.

Sheets.—Sheets show no increase in strength, though enjoying a fair movement. Our quotations given below are shaded by some mills anxious for business from 50 cents to $1 a ton. With this reservation, we quote one pass, cold rolled, blue annealed sheets, carload lots, mill shipments, Chicago delivery, as follows: Nos. 9 and 10, 1.77½c to 1.79½c; Nos. 11 and 12, 1.79½c to 1.86½c; Nos. 13 and 14, 1.86½c to 1.91½c; Nos. 15 and 16, 1.89½c to 2.01½c. On box annealed, one pass, cold rolled: Nos. 18 and 20, 2.01c to 2.06½c; Nos. 22 and 24, 2.06½c to 2.11½c; Nos. 25 and 26, 2.11½c to 2.16½c; No. 27, 2.16½c to 2.21½c; No. 28, 2.26½c to 2.31½c; No. 29, 2.41½c to 2.46½c; No. 30, 2.51½c to 2.56½c. We have revised our prices on lots from jobbers' stocks, which are $2 a ton lower than a week ago. We quote No. 10, 1.90c to 2c; No. 12, 1.95c to 2.05c; No. 14, 2c to 2.10c; No. 16, 2.10c to 2.20c; No. 18, 2.20c to 2.30c; No. 20, 2.25c to 2.35c; No. 22, 2.30c to 2.40c; No. 24, 2.35c to 2.45c; No. 26, 2.40c to 2.50c; No. 27, 2.50c to 2.60c; No. 28, 2.60c to 2.70c; No. 29, 2.70c to 2.80c. Galvanized sheets are improving, and we quote Pittsburg discounts, f. o. b. mill, 80 and 5 to 80 and 10. For shipment from stock, we quote heavy gauges and wide widths, 75 and 5 to 75 and 10 percent; for light gauges, 75, 10 and 5½ percent to 80 percent.

Structural Steel.—The reduction in prices seems to have had no effect in the way of increasing consumption; rather has it retarded the buying movement by only partially meeting the views of consumers. Independent producers of channels, angles and lighter shapes are shading the new prices and taking what little business is being offered. The trade is, if anything, in a more unsettled condition today than it was prior to the announcement of the reduction. We quote association prices, carload lots, Chicago delivery, as follows: Beams and channels, 15 in. and under, 1.56½c; angles, 3 to 16 in. inclusive, 1.56½c; zees, 3 in. and over, 1.56½c; tees, 3 in. and over, 1.61½c. On lots from store, we quote beams, channels and angles, 3 x 3 and larger, 1.80c to 1.90c; beams, 18, 20 and 24 in., 10c extra; tees, 5c extra.

Plates.—A fair amount of business has been booked by mills during the week under review, although it is freely admitted the tonnage is not as great as was expected would follow the change in prices. Independent mills are shading pool quotations $1 a ton. We quote, with this reservation, carload lots, for Chicago delivery as follows: Tank steel, ¼ in. and heavier, 24 in. wide and under, rectangular plates only, 1.46½c base; over 24 in. to 100 in. wide, 1.56½c base; flange steel, 1.66½c base; marine steel, 1.76½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Less than carload lots, 5c extra. Prices from store have also been changed, and we quote tank steel, ¼ in. and heavier, 1.80c to 1.90c; 3-16, 1.90c to 2c; No. 8, 1.90c to 2c; flange steel, 2.05c to 2.15c.

Rails and Track Supplies.—Light rails are in good demand and prices continue to strengthen. There is also a fair call for track supplies, the output of mills going into immediate consumption. Specifications and orders for heavy sections show a falling off, and mills will carry over into the new year large undelivered tonnages. As the track laying season is almost over, a lull is expected in the demand for this product until after the meeting of the rail pool next month. We quote as follows: Heavy sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; light rails, $22 to $24; track supplies, f. o. b. Joliet mill, angle bars, 1.35c; spikes, first quality, 1.65c to 1.75c; track bolts, 3½ x ¾, with square nuts, 2.20c to 2.30c per 100 lb.; with hexagon nuts, 2.35c to 2.45c.

Merchant Steel.—The only feature of interest to report is that specifications are good. The contracting season for the products listed below is over, and new tonnage is not expected to be very great for the next few months. Prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows. Spring steel, 1.90c; sleigh shoe, flat sizes, 1.56½c; concave and convex, 1.76½c; cutter shoe, 2.25c; smooth finished machinery steel, 1.76½c base; smooth finished tire, 1:71½c; plow steel, 2.20c and upward according to quality; toe calk, 2.06½c base. Ordinary grades of crucible tool steel, 6½c to 8c; special tool steel, 12c up. Cold rolled shafting, 52 percent from list in

carload lots, and 47 percent discount in less than carload lots.

Merchant Pipe.—Producers report an exceptionally good demand, jobbers sending in heavy specifications for stocks for winter and spring use. We quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel Pipe		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	69.35	53.35	67.35	51.35
⅜ and ½ inches	73.35	71.35	71.35	69.35
¾ to 6 inches	77.35	67.35	75.85	65.85
7 to 12 inches	72.35	57.35	70.85	55.85

Boiler Tubes.—Jobbers report a good business and that prices are being firmly maintained. Many concerns are replenishng their stocks ıor the winter trade, these having been allowed to reach a low point. We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	46.35	41.35	52.35
1¾ to 2¼ inch	58.35	41.35	40.35
2½ inch	60.35	46.35	48.35
2¾ inch to 5 inch	66.35	53.35	Up to 4 inches.
6 to 13 inch	58.35	41.35	50.85

The following are the agreed discounts from store. Chi-

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches	42½	37½	40
1¾ to 2½ inches	52½	35	37½
2½ inches	55	37½	40
2¾ to 5 inches	62½	47½	47½
6 inches and larger	52½	35	..

Cast Iron Pipe.—There is nothing of noteworthy interest to report. Orders are limited to the routine of small lots which come in the daily mail. Prices are firm and without change. On carload lots, Chicago delivery, we quote 4-in. water pipe, $25.50; 6-in. to 12-in., $24.50; larger sizes, $24; gas pipe, $1 a ton higher.

Wire Products.—There is no cessation to be observed in the demand for wire products that has been felt since the new schedule was adopted. Jobbers in all parts of the west and southwest report their stocks low and are making urgent requests for immediate shipments of their specifications. Prices are without official change, and we quote carload lots to jobbers, mill shipments, Chicago delivery, as follows: Wire nails, 1.75c; painted barb wire, 1.90c; galvanized barb wire, 2.20c; smooth annealed wire, 1.60c; smooth galvanized wire, 1.90c; polished staples, 1.85c; galvanized staples, 2.15c. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½c and 5 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Foundry Coke.—The local market shows signs of increasing strength. Demand is heavier and prices firmer. Advances over present prices are asked on orders for shipment in the new year. We quote coke from Wise county, Va., $2 at the ovens, or $4.25 Chicago. Coke from the Pocahontas and New River districts, the freight rate of which to Chicago is $2.65, as offered in this market on the basis of $1.65 to $1.75 at the ovens. Standard 72-hour Connellsvile grades are firm at $2 at the ovens, or $4.65 Chicago. Solvay coke from the Milwaukee plant is being offered at $4.50 to $4.75 Chicago.

Old Material.—There is little or no change to the local situation. Dealers are still maintaining their high prices and absorbing all the material offered from time to time by the railroads. Practically the entire 8,000 tons offered for sale last week has been taken out of the market. This week several new lists are out, including one from the C. M. & St. P. for 2,500 tons; C. B. & Q., 2,500 to 3,000 tons; and the C. & E. I., 300 tons. We have advanced our prices on heavy melting steel, cut boilers, iron car axles, steel axle turnings, agricultural malleable, stove plate and old iron splice bars. We quote dealers' selling prices as follows:

Old iron rails	$15 75 to 16 25
Old steel rails (4 feet and over)	11 50 to 12 00
Old steel rails (less than 4 feet)	10 50 to 11 00
Relaying rails, subject to inspection	21 50 to 22 50
Relaying rails for sidetracks	18 00 to 20 00
Old wheels	11 00 to 12 00
Heavy melting steel	10 00 to 10 50
Mixed country steel	7 00 to 7 50

The following quotations are for net tons:

Low phosphorus scrap (.04 and under)	$12 00 to 13 00
No. 1 R. R. wrought	12 00 to 12 50
No. 2 R. R. wrought	11 00 to 11 50
Shafting	12 50 to 13 00
Dealers' Forge, No. 1	9 00 to 10 00
Wrought pipe and flues	8 00 to 8 50
No. 1 cast, 150 lb. and less	10 50 to 11 00
No. 1 mill	6 00 to 6 50
Country sheet	5 00 to 5 50
No. 1 boilers, cut	8 00 to 8 50
Boiler punchings	9 50 to 10 00
Iron car axles	16 00 to 16 50
Steel car axles	13 50 to 14 00
Iron axle turnings	7 50 to 8 00
Steel axle turnings	7 50 to 8 00
Cast borings	4 25 to 4 75
Mixed borings, etc	4 25 to 4 75
Wrought turnings	7 00 to 7 50
Machine shop turnings	7 00 to 7 50
Railroad malleable	9 00 to 9 50
Agricultural malleable	8 75 to 9 25
Stove plate and light cast scrap	9 00 to 9 50
Old iron splice bars	13 50 to 14 00

CLEVELAND

OFFICE OF *The Iron Trade Review*, 1064 ROSE BUILDING, Sept. 21.

Iron Ore.—Although sales have been made slowly, their aggregate is large compared with the total shipments, which are about 6,000,000 tons short of last year. The result is that there is now a scarcity of some grades of non-Bessemers. A large concern which operates furnaces and also sells ore thought it had provided for its furnace requirements, but, finding a few days ago that it would need more non-Bessemer than it had estimated, was compelled to go into the market and buy and found difficulty in placing its orders. The result of this scarcity is that prices are firmer. While it is possible that old range non-Bessemer can be had at $2.75, the price is more likely to be $2.85, while $2.50 is the usual price for non-Bessemer Mesabis. For Bessemers, old range sell at $3 to $3.35 and Mesabis at $2.75 to $3. Freight rates have not changed, but are firm at 65 cents from the head of the lakes, 55 from Marquette and 50 from Escanaba. Ore is moving rapidly, the dispatch being better than for several years, but the coal movement is slow. If the vessels were moving as rapidly from docks at the head of the lakes as they are from Lake Erie docks, there would be many without cargoes. The delays at upper ports are giving all vessels a chance at the business.

Pig Iron.—Foundries are pretty well covered for the rest of the year and some are inquiring for the early part of the new year, but furnaces are looking for improvement and are not willing to quote for delivery after Jan. 1. Hence transactions are few except for small amounts for immediate needs. Basic is selling at $11.75 at Valley furnace and malleable at 25 cents more. In No. 2 foundry, the range is still $11.75 to $12, as it has been for a month or more. Southern iron is selling at $9.25 to $9.50; Birmingham, for No. 2, in very limited quantities. On account of the strike of coal miners, very little Southern iron is being offered. We quote as follows for Cleveland delivery:

Bessemer	$12 60 to 12 75
No. 1 Strong Foundry	12 85 to 13 00
No. 2 Strong Foundry	12 60 to 12 85
No. 3 Foundry	12 25 to 12 50
No. 2 Southern	12 10 to 12 25
Gray Forge	11 85 to 12 00
Gray Forge, Southern	12 00 to 12 15
Lake Superior charcoal	14 50 to 15 00

Finished Material.—The reductions in billets and bars were about as expected and it is now hoped that, as the last of the meetings, except that of rail manufacturers, has been held, and as there is no probability of further reductions, business will move along more satisfactorily. No decided improvement is expected, however, to take place this year. The dullness in bar iron is fully as pronounced, but some producers are trying to get 1.30c. The usual price, however, is 1.25c at the mill and there is reason for believing that this price has been shaded. Some producers say that, at present cost of labor and scrap, bars can not be rolled at less than 1.25c. Steel bars, now quoted at 1.39½c Cleveland, for Basic and 1.44½c for open-hearth, have been

reduced $1 per ton and are selling at the price which prevailed before the advance of last April. The sheet business is dull and official quotations are being shaded. The prices of the principal producers through jobbers are as follows, Cleveland delivery, the freight from Pittsburg being 9½ cents. Mill sales of black sheets in carload lots, No. 10, 1.64½c; No. 11-12, 1.69½c; No. 14, 1.79½c; No. 16, 1.89½c; No. 27, 2.14½c; No. 28, 2.24½c. Galvanized, mill sales, No. 14, 2.24½c; No. 16, 2.34½c; No. 18-20, 2.49½c; No. 22-24, 2.64½c; No. 25-26, 2.84½c; No. 27, 3.04½c; No. 28, 3.24½c. Out of stock, black sheets: ¼-inch, 1.90c; 3-16-inch, 2c. Blue annealed: No. 10, 2.05c; No. 12, 2.10c; No. 14, 2.15c; No. 16, 2.25c. One pass cold rolled: No. 18-20, 2.35c; No. 22-24, 2.40c; No. 26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 30, 3c. Galvanized out of stock: No. 16, 2.60c; No. 18-20, 2.70c; No. 22-24, 2.85c; No. 26, 3.05c; No. 27, 3.25c; No. 28, 3.45c; No. 30, 4.25c.

Old Material.—The market is very quiet and prices are stationary. We quote as follows, gross tons, Cleveland:

Old iron rails	$15 00 to 15 50
Old steel rails (over 6 feet)	12 00 to 13 00
Old steel rails (under 6 feet)	11 00 to 12 00
Old car wheels	10 00 to 11 00
Steel boiler plate	9 00 to 10 00
Malleable iron (railroad)	10 00 to 10 50
Malleable iron (agricultural)	8 00 to 9 00
Heavy steel	10 00 to 11 00

We quote as follows, net tons:

No. 1 R. R. wrought	$10 50 to 11 50
No. 1 busheling	9 50 to 10 00
No. 1 machine cast	9 50 to 10 50
Iron axles	16 00 to 16 50
Axle turnings	7 00 to 8 00
Wrought turnings (free from cast)	6 00 to 6 50
Grate bars	7 00 to 8 00
Pipes and flues	8 00 to 8 50
Tank iron	7 50 to 8 00
Hoop and band iron	5 00 to 5 50
Sheet iron	4 00 to 5 00
Wrought drillings	6 00 to 6 50
Stove plate	8 00 to 9 00
Steel axles	13 00 to 14 00
Cast borings	5 00 to 5 50

CINCINNATI.

Sept. 20.

Coke.—The coke market in a general way is slightly more active than in the precedng week, but there has been no change in the price basis and Connellsville brands of foundry coke are quoted at $1.90 to $2.05 f. o. b. ovens. Some furnace coke has been sold to go from the Stonega district to Birmingham to relieve the furnaces there on account of the strike of the coal miners. There is not much of this coke available and sales are rather spasmodic, there being no regular traffic in this coke.

Pig Iron.—There is a slight improvement in the demand for pig iron, but only to an extent that warrants the observation and not of sufficient importance to be of decided note. The rank and file of small buyers are still only covering their current needs, but there is more inquiry of this character than last week. A few of the large consumers have bought some iron and there are some inquiries from this source to be figured on and which will probably be closed up in the near future. Some Southern iron sold in the Pittsburg market last week to two large concerns. Two thousand tons of No. 3 foundry went at $8.75 Birmingham and a part of the 2,000 tons of gray forge taken by another concern sold at $8.50 Birmingham. A Michigan consumer bought 1,000 tons of foundry iron and 1,000 tons of Southern silvery. An Ohio manufacturer is in the market for 1,000 tons of Northern and Southern iron for delivery in the first quarter of next year. An Indiana consumer is asking for quotations on 2,600 tons Southern iron for deliveries running from October to February inclusive. An inquiry from a large concern that buys through Pittsburg for 5,000 tons is expected to come out this week with full specifications. A large bridge building company is in the market for 1,000 tons for St. Louis delivery and a car building company is figuring on 11,500 tons of iron on analysis for delivery in St. Louis. This latter inquiry is mainly for charcoal iron. An Indiana concern bought 5,000 tons of malleable iron during the week. As to prices there is no change and Southern iron is still quoted at $9.25 Birmingham as an inside figure while the strictly Birmngham brands are still held at $9.50 f. o. b. furnace. In Ohio irons the asking price is mainly $12.00 furnace while an occasional quotation as low as $11.50 is still made on attractive business. Ohio silvery iron is a shade stronger and Jackson county silvery is quoted at $15.50 furnace for 8 percent silicon. There is no improvement in the Birmingham strike situation and, while the operators are getting a few more to work all the time, the gain is not sufficient to put any more furnaces in blast. It is believed in the trade that so long as the strike lasts there will be no decline in Southern irons as the output now is well taken care of by demand for mixtures and for consumption in the territory that is non-competitive with Northern iron. We quote in carload lots f. o. b. Cincinnati.

Southern Foundry No. 1	$12 50 to 12 75
Southern Foundry No. 2	12 00 to 12 25
Southern Foundry No. 3	11 50 to 12 00
Southern Foundry No. 4	11 00 to 11 25
Southern Foundry No. 1 soft	12 50 to 12 75
Southern Foundry No. 2 soft	12 00 to 12 25
Gray Forge	11 00 to 11 25
Northern Foundry No. 1	13 15 to 13 65
Northern Foundry No. 2	12 65 to 13 15
Southern car wheel iron	16 25 to 16 50

Finished Material.—The market is active in a jobbing way as current wants are being taken care of in a hand-to-mouth manner. Large orders are scarce. Buyers have been holding off in expectation of lower prices, and are anticipating their wants. Odds and ends in structural pieces are selling fairly well. Bar iron is still quoted at 1.35c; steel bars at 1.48c, half extras, with dealers quoting 1.60c to 1.75c for iron and steel out of store. Galvanized sheets are at 75 and 10 to 75, 5 and 2½ percent off. We quote black sheets, No. 27, at 2.25c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.60c; No. 27, 2.50c; No. 16, 2.30c; No. 14, 2.20c; No. 12, 2.10c; No. 10, 2.05c. Tank plates are dull and sell out of store at 2c for ¼-inch, 3-16-inch, No. 8 and No. 10. Beams and channels are quoted at 2c from stock and angles at 1.90c to 2c for base sizes.

In merchant pipe there is no change in the market. Independent mils are underselling the schedule of the leading interest but the leading interest is strictly maintaining the published quotations. Trade is rather quiet.

Carload lots are quoted as follows f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼ inch	69.7	53.7	67.7	51.7
⅜, ½ inch	73.7	61.7	71.7	59.7
¾ to 6 inch, inclusive	77.7	67.7	76.2	66.2
7 to 12 inch, inclusive	72.7	57.7	71.2	55.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
to 1½ inch	41.2	37.7
1¾ to 2¼ inch	54.2	36.7
2½ inch	56.7	41.7
2¾ to 5 inch	63.2	40.2
6 to 12 inch	54.2	36.7

Old Material.—The market remains quite with no quotable change prices and in the absence of business quotations are largely nominal. We quote:

Old No. 1 railroad wrought, net tons	$11 00 to 11 50
Cast machine and fcundry, net tons	9 50 to 10 00
Old iron rails, gross tons	12 50 to 13 00
Old steel rails, gross tons	9 50 to 10 00
Old short lengths, gross tons	10 00 to 10 50
Old iron axles, net tons	13 50 to 14 00
Stove plate, net tons	6 00 to 6 50
Wrought turnings, net tons	6 00 to 6 50
Cast borings, net tons	3 00 to 3 50

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Sept. 20.

Pig Iron.—Several conditions in the market showed an improvement during the past week. Not only were sales larger in point of tonnage, but individual contracts were for larger amounts, and for longer delivery. Heretofore the bulk of sales made has been from 50 to 100 tons and for immediate shipment, but during the week there were many sales for from 100 to 400 tons, delivery on the major portion of which was for the balance of the year. It is difficult to say whether the increased willingness of buyers to enter the market is due to an improvement in their business, or to the replenishment of stocks that had become much depleted. Some think both causes have operated in the matter. Prices

are firmer also, Northern makers especially not showing the same anxiety as recently to take business at the expense of prices. Southern interests are still quoting $9.50 for No. 2 foundry Birmingham, for delivery the balance of the year. One of the sales of the week was for 1,000 tons at this figure, with some good sales hanging in the balance. The directors of one large Southern company, which has over 50,000 tons of pig iron stored in its yards, recently met to consider what disposition would be made of it. After a lengthy discussion, they decided not to dispose of any of it below schedules now in force. Some of the directors were most sanguine of the outlook for next year, and believed No. 2 foundry would be selling at about $12 Birmingham before the year was over. New York quotations at tidewater follow: Northern No. 1 X, $14.50 to $15; No. 2 X, $14 to $14.50; No. 2 plain, $13.50 to $14; Southern No. 1 foundry, $13.50 to $13.75; No. 2 foundry, $13 to $13.25; No. 3 foundry, $12.50 to $12.75; No. 4 foundry, $12.25 to $12.50.

Billets.—Dispatches from Pittsburg announce that billets have been reduced to $19.50 Pittsburg, but as freight is added, the reduction to New York consumers is only $2.65.

Finished Iron and Steel.—The situation in the structural material market during the past week was one of extreme dullness. No large contracts were placed, and small orders booked did not amount to much in the aggregate. So far as recent developments go, reductions made lately do not seem to have stimulated trade any. Some railroads which had specifications out for small amounts for bridge work, withdrew them during the week. This is said to be due to their earnings recently not being large enough to justify improvements they had contemplated. From Pittsburg comes the report that the prices for angles, tees, and channels under 3 inches have been reduced $1 per ton from 1.45c to a 1.40c base at Pittsburg. Bars have also been reduced $1 per ton from 1.35c to 1.30c base Pittsburg. Business in bars during the week was suspended pending the outcome of the meeting of the bar pool. Trade in plates is a little better, but considerable improvement is yet to be desired. Sheets are quiet, with prices none too strong. New York prices at tidewater follow: Angles 3 to 6 in. x ¼ in. and heavier, 1.54½c; beams, 3 to 15 in., 1.54½c; channels, 3 to 15 in., 1.54½c; beams, 18, 20 and 24 in., 1.64½c; tees, 3 x ¼ in. and heavier, 1.59¼c; plates, carloads, tank, 1.54½c; flange, 1.64½c; marine and ordinary fire box, 1.74½c; refined iron and soft steel bars, 1.44½c; sheets, in carload lots New York, No. 28, black, 2.25c to 2.30c; galvanized, 3.25c to 3.30c.

Old Material.—Outside of the fact that prices do not seem to have a strong undertone, the market during the past week was without change. Heavy offerings by railroads in the West, with the prospect of more to come, together with general disappointment over the failure of prices to advance this month as was expected, have made some holders turn sellers. Still there is very little material changing hands, and the prices of such material as have been prominent and strong for several weeks past, continue firm. Prices f. o. b. cars follow:

Old iron rails	$14 00 to 14 50
Old steel rails, long lengths	11 50 to 12 00
Old steel rails, short pieces	11 00 to 11 50
Relaying rails	19 00 to 20 00
Old car wheels	11 50 to 12 50
Old iron car axles	17 00 to 18 00
Old steel car axles	14 00 to 14 50
Heavy melting steel scrap	11 50 to 12 00
No. 1 railroad wrought scrap	11 50 to 12 00
Iron track scrap	10 50 to 11 00
Wrought pipe	7 75 to 8 25
Ordinary light iron	4 50 to 5 25
Cast borings	3 50 to 4 00
Wrought turnings	5 50 to 6 00
No. 1 machinery cast	9 00 to 10 00
Stove plate	7 75 to 8 25

BIRMINGHAM.

BIRMINGHAM, Ala., Sept. 19.—The Alabama pig iron market shows a little weakness this week and quotations are not as firm as they have been. There is open confession that No. 2 foundry iron has been selling at $9.25 per ton, while even that price may be shaded some on close inquiry. The larger furnaces are holding their iron for $9.50 per ton, however, and one concern announces that it is thinking of withdrawing from the market until there is improvement. The sales are in small lots. Shipments are steady, as compared to what they have been in the last eight weeks. The production fell off a little again during the past week, the Tennessee Coal, Iron & Railroad Co. closing down one of its Ensley furnaces on account of an accident to some of the machinery. The furnace is not to be out of service very long, the machinery being put back in shape just as rapidly as men can do so. There appears to be an inclination on the part of some of the manufacturers in this district to accumulate their iron rather than sell under $9.25 to $9.50, No. 2 foundry, and while there has been no iron so far shoved to the yards, unless there should be a strengthening in the conditions the piles of iron on the yards are likely to swell a little. There have been more or less reductions made in the accumulated iron piles since the curtailed production in this State. The strike of the coal miners is still on, but the operators are bringing in more and more non-union labor for the mines every day and their coal and coke production is steadily improving. The operators claim to have the better of the fight so far.

There is no change in the finished iron and steel circles and with the exception of the work in three departments of the Bessemer, Ala., mills, belonging to the Tennessee company, non-union labor employed, there is nothing being done in the rolling mills in this district.

The following pig iron quotations are given: No. 1 foundry, $9.50; No. 2 foundry, $9.25 to $9.50; No. 3 foundry, $8.50 to $9; No. 4 foundry, $8.50 to $8.75; gray forge, $8 to $8.25; No. 1 soft, $9.50 to $9.75; No. 2 soft, $9.25 to $9.50.

No change is reported in the steel situation.

Notwithstanding the decisions of the conciliatory board of the Amalgamated Association of Iron, Steel & Tin Workers as to a wage contract at the rolling mills of the Republic Iron & Steel Co., there will be no resumption of work at the mills of that company in this district until the coal miners' strike is settled or the production with non-union labor is improved more than it is as present.

The demand for cast iron pipe is still healthy and the plants in this section are busy. Prices for that product are favorable. Both the Dimmick Pipe Co. and the United States Cast Iron Pipe & Foundry Co. made bids for part of the contract to be let by the Isthmian Canal Commission for pipe and fittings to be used in constructing a water works system in Panama. The contract ought to be awarded this week.

Reports from Battelle, in DeKalb county, are to the effect that the new furnace of the Lookout Mountain Iron Co., which went into blast on the 12th inst., is doing nicely. The furnace is expected to wear off its newness in a hurry and get down to hard work.

The Metal Market.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Sept. 20.

Little, if any, change is to be observed in the local metal market. Demand is good, though limited to small lots for immediate shipment, and prices are firmer than they have been for several weeks. The outlook is bright and the indications are that a good trade will be felt this fall and winter. We quote prices as follows: Lake copper, carloads, 12⅞c, and for smaller lots, 13⅛c; casting, 12⅝c for carloads, and 13c for lesser quantities. Pig tin, 28¼c to 28¾c, according to quantity. Spelter, 5⅛c to 5⅜c, according to quantity; sheet zinc, 6c for carload lots of 600-lb. casks, and 6.25c to 6.35c for less than carload lots. Pig lead, 4.20c for 50-ton lots, 4.25c for carload lots, and 4.35c for smaller lots.

Old metals are without quotable change, as follows: Copper wire and heavy, 11c; copper bottoms, 9¼c; copper clips, 10¼c; red brass, 9½c; red brass borings, 7¾c; yellow brass, heavy, 7¼c; yellow brass borings, 6¼c; light brass, 5½c; tea lead, 3½c; zinc, 3.55c.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1815, No. 150 NASSAU ST., Sept. 20.

Pig Tin.—After being strong all the week, the market today sold off a little, with the result that the lowest prices for the week were reached. Withal closing quotations today are ¼c to ⅓c higher than those which prevailed a week ago. The London market for the week was active, with an upward

tendency, and prices at this writing are considerably stronger than a week ago. Closing quotations today follow: Spot and September, 27.75c to 28.00c; October, 27.75c to 27.90c. London's closings today follow: Spot, £127 17s 6d; futures, £128 7s 6d. Arrivals at Atlantic ports for the month to date aggregate 1,810 tons with 1,345 tons afloat.

Copper.—The metal was considerably firmer during the past week, due, among other things, to the trade situation presenting a more hopeful aspect. The London market has been strong also, and cable dispatches from there were all encouraging. Closing prices today follow: Lake, 12¾c to 13c; electrolytic, 12¾c to 12⅞c; castings, 12½c to 12⅝c. London's closings today follow: Spot and futures, £58 5s. Exports for the month to date aggregate 8,775 tons.

Lead.—Is quiet and unchanged at 4.20c to 4.30c for spot. St. Louis and London both remain at 4⅛c and £11 16s 3d, respectively.

Spelter.—Is strong and in fair demand at 5.10c to 5.20c for spot. St. Louis remains at 4.95c. London unchanged at £22 10s.

Antimony.—Both Cookson's and Hallett's are 7c asked. Other grades are 6c asked.

Quicksilver.—We quote $40 per flask of 76½ pounds in lots of 100 flasks. London is £7 15s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c to 60c for smaller quantities.

Personal.

William Wieman, formerly manager of the Cleveland office of the Field-Evans Iron Co., has taken charge of the Pittsburg office of the same company, succeeding Bryan Robertson, who has resigned.

Bryan Robertson, well known in the iron and steel trade in the Pittsburg district, and who until recently sold pig iron for the Sloss-Sheffield Steel & Iron Co. in Pittsburg and vicinity, has opened an office at 701 Keytsone building, Pittsburg, for the sale of pig iron, coke and cinders.

J. W. Rathbone, formerly connected with the Penn Steel Casting Co., has been appointed superintendent of the Birmingham Steel & Iron Co., Birmingham, Ala.

Henry Pels, of Germany, head of the firm of Henry Pels & Co., 66 and 68 Broad street, New York, is at present paying a short visit to the United States.

F. B. Richards, of M. A. Hanna & Co., Cleveland, sailed Sept. 16 on the Cedric for Europe, accompanied by his family.

F. T. F. Lovejoy, of Pittsburg, who has been very ill, is much improved. He is at Colorado Springs and hopes to return to Pittsburg within a month.

William H. Crow has accepted a position as superintendent of the American Pattern Co., of Cleveland, O. For several years Mr. Crow worked in machine shops in Youngstown, O. He then became foreman for the Forsythe Pattern Co., of Youngstown, and later assistant foreman for the William Tod Co.

The immense Pullman Car Works, at Pullman, Ill., are now practically closed and nearly 7,000 employes are idle, 1,500 having been laid off last week. Only about 100 men are employed putting finishing touches on what little work is to be done.

The directors of the National Emery Wheel Co., Worcester, Mass., have offered the plant of the company for sale. In case no purchaser is forthcoming, the two mortgages held on the plant amounting to $15,000 will be foreclosed and some sort of a reorganization will be effected.

The acquisition of the Safety Insulated Wire & Cable Co., Portland, Me., by the National Steel & Wire Co., New Haven, Conn., was ratified at the annual meeting of the latter company.

The Canadian Pacific railway has asked the Lake Superior Corporation, Sault Ste. Marie, Ont., if it can comply with its specifications and supply the railroad with 40,000 tons of steel rails, to be delivered at the rate of 10,000 tons a month, starting February, 1905. The corporation has signified its willingness to contract for the entire amount.

WESTINGHOUSE AIR BRAKE CO.

The cut in the annual dividend rate of the Westinghouse Air Brake Co., Pittsburg, is fully explained in a circular mailed the stockholders this week. The reduction in the dividend is from 24 to 20 percent. The letter, with an abstract of the earnings is as follows:

"During this period the limited purchases by railway companies of new equipment and current supplies caused a reduction of 40 percent in the net sales of brake apparatus as compared with the previous year, while the reduction in net earnings was less, being 31 percent, due to economy of operation and an increase in income from other sources.

"Following our usual policy on account of diminished business, it was deemed advisable in March to reduce the extra dividend from 3½ percent to 2½ percent, this with the regular 2½ percent making the quarterly dividend at the annual rate of 20 percent in place of 24 percent last year. Experimental work done during the past year in the development of new and improved brake devices has been extensive and important. Its cost, as heretofore, has been charged to expense, but the results already attained are so promising that any depreciation of the patent account by reason of approaching expirations has been postponed. The interest previously acquired by this company in the inventions of Mr. George Westinghouse, pertaining to the multiple control operation of motors of railway trains, with a view to the manufacture of the electro-pneumatic devices used in this connection, was recently sold to the Westinghouse Electric and Mfg. Co. at a net profit to this company of $330,000. This transaction, however, was not completed in time to appear in the current statement.

"As explained last year, a depreciation reserve fund of $300,000 was set aside to guard against a possible shrinkage of inventory values through decrease in the price of purchased material. For this reason stated between July 31, 1903, and July 31, 1904, there was a reduction in the cost value of certain apparatus carried in stock approximating $24,000, which has been charged to that fund. Other depreciation charges aggregating $26,022.08 have been approved, which correspond closely to the action taken last year in this regard."

EARNINGS.

Net sales brake account	$ 5,082,844.37
Gross income other sources	857,109.73
Total	$ 5,939,954.10

EXPENSES.

Shop-cost of product sold	$ 3,061,861.91
General and other expenses	513,911.81
Total	$ 3,575,773.72
Depreciation, etc., of property and accounts receivable	26,022.08
Total charges	$ 3,601,795.80
Credit general profit and loss	2,338,158.30
Total	$ 5,939,954.10

The general balance sheet is as follows:

ASSETS.

Cash on hand	$ 2,102,182.78
Accounts and bills receivable	2,415,097.79
Railway and other securities	1,687,745.31
Stock in associated companies	2,398,841.72
Patents at capital appraisement	2,000,000.00
Wilmerding plant	2,116,250.66
Real estate (including Westinghouse building)	1,700,000.00
Factory stores	1,507,101.23
Total	$15,927,219.49

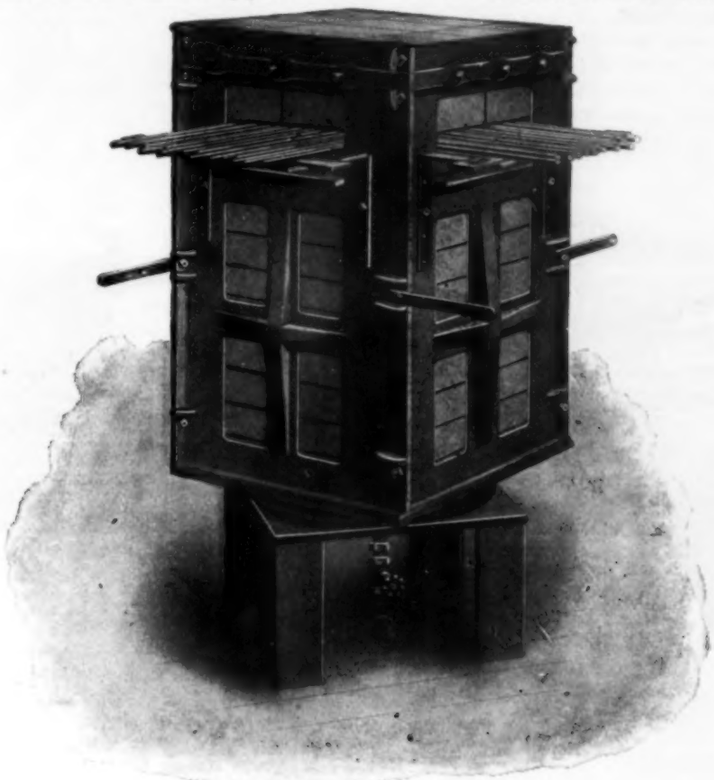
LIABILITIES.

Capital stock		$10,990,450.00
Rebates and accounts payable		746,734.26
Depreciation reserve fund		275,906.01
General profit and loss account:		
Balance July 31, 1903	$3,993,869.92	
Profit for fiscal year	2,338,158.30	
Total	$6,332,028.22	
Less dividend account	2,417,899.00	
		3,914,129.22
Total		$15,927,219.49

OIL FURNACE FOR HEATING FORGINGS.

We illustrate herewith the Gorham revolving forge furnace, recently placed on the market by the National Machinery Co., of Tiffin, O. It is an oil or gas burning furnace, and is especially suitable for use in connection with bolt headers, or forging machines, for heating bolt blanks, wheel spokes and similar forgings. The design allows the four sides of it to be used as heating surfaces. The furnace proper turns on a ball bearing base, and is revolved by the attendant with ease. This arrangement gives a maximum of floor space, and as only one side of the furnace faces the operator the heat radiated upon him is slight. There is a large economy of fuel in comparison with a horizontal furnace of equal capacity, as the irons to be heated are in the most advantageous place, i. e., where the hot gases concentrate, and where the heat is most intense. The heating effect is uniform as the irons are practically equidistant from the burner, and will heat at the same rate of speed.

The lining and also the top of the furnace are made of commercial size 9-in. fire brick. Either a low or high pressure burner is used—one requiring an air blast of about eight ounces per square inch, and the other a blast of 15 pounds or more per square inch. The burner is attached to the base of the furnace, and is vertical and stationary, requiring no swivel joints.



THE GORHAM REVOLVING FORGE FURNACE

The spray of air and oil passes from the burner through a flue at the bottom of the chamber, strikes against a baffle brick and ignites after passing it. The heating chamber is vertical and revolving, and although a few vent holes are provided upon the top, a chimney is unnecessary as the combustion is practically perfect, and the escape of gas is slight. The openings in the top of the sides of the heating chamber are to be partially bricked in, leaving suitable slots to receive the irons to be heated. Suitable lighting and slag holes are provided, and the internal arrangements prevent slag from flowing into and clogging burner flue.

The approximate output per hour is 400 1-in., 700 ¾-in. or 1,000 ½-in. blanks heated three diameters in length. The net weight of this machine complete with lining is 1,400 lb. The floor space occupied is 21 x 21 in. and the height is 4 ft.

The American Automatic Lubricating Co., St. Louis, recently incorporated, was formed for the purpose of placing on the market its automatic lubricating machine to lubricate the necks of the hot rolls in steel rolling mills. Instead of lubricating in the old way with a hand swab or by cake grease this machine is employed to perform the lubrication automatically. It is claimed that its adoption will very materially cheapen the production of sheet metal.

Direct Casting at an English Foundry.

The recent opening of a foundry at Wellingborough, Eng., at which direct casting is carried on was referred to as follows by the London *Times:*

"About 50 years ago an iron-founding works was established in the town of Wellingborough by Mr. Thomas Butlin for the purpose of utilizing the iron ores of Northamptonshire for foundry purposes. So successful was the venture that in course of time extensive works were built outside the town, and are known as the Irthlingborough Iron Works. A special product of these works is what are known as direct castings —that is, castings made direct from the blast furnace instead of the iron being run into pigs and remelted for casting. This process was devised a few years ago by Mr. W. H. Butlin, a son of the founder of the business the growth of which has led to the erection of a new foundry. This was formally opened by Lord Lilford, a large number of visitors being present. The visitors were shown over the works, and witnessed the direct casting in operation. In this process, Northamptonshire iron ores of various grades are carefully selected, mixed, and smelted in the blast furnace at a low temperature, a special flux being employed. The firm have four open-top blast furnaces, two of which were in blast at the time of the visit. The molten iron is run from the furnace into large ladles, from which it is transferred into smaller ones, which are run on wagons into the foundry, where the iron is molded into castings of various kinds, large and small. The output of iron from the blast furnaces is about 700 tons per week, about 180 tons of which is converted into castings, the remainder being placed on the market in the form of pig iron. Among other things the visitors saw the casting of segments of the lining for the Great Northern, Strand and Piccadilly Tube Railway now in course of construction, the segments being turned out at the rate of 100 tons per week."

The foundry formerly occupied by the Seating Co., of Harrison, O., has been leased to the Campbell Corn Drill Co.

A NEW QUICK CHANGE GEAR.

A new quick change gear for machine tools has recently been patented by R. K. LeBlond and William F. Groene, of the R. K. LeBlond Machine Tool Co., Cincinnati. The device is illustrated in Fig 1 as applied to the 16-in. lathe of that make. Fig. 2 is a front view of the new gear box and Fig. 3 illustrates the back of gear box as removed from the lathe. Fig. 4 is a longitudinal section through the feed box and Fig. 5 is a cross section taken along the line b-b in Fig. 4.

Taking up the construction of the device as depicted in Figs. 4 and 5, the casing A contains a shaft B mounted in bearings and carrying a series of gears of different diameters. These constitute a cone of gears to which motion may be given and in the present instance the shaft B is the lead screw of a lathe. A shaft C is parallel to B and has a wide faced gear corresponding to the combined width of the gears on the shaft B. This is driven from the lathe cone in the usual manner through tumbler gears as in Fig. 1.

A stationary cylinder D surrounds the driving gear on C and is turned to enter the bore of the bushing E with a sliding fit. This bushing or carrier E has a handle G and is capable of movement around as well as lengthwise of the stationary cylinder D. The handle G has a locking pin which engages any one in a series of holes shown to best advantage in Figs. 1 and 2. The bushing E carries a spindle and gear H which is in constant driving connection with the long gear on the shaft C. The slot in the stationary cylinder is of sufficient width to permit the intermediate gear H to be engaged with or disengaged from any one of the cone of gears on B.

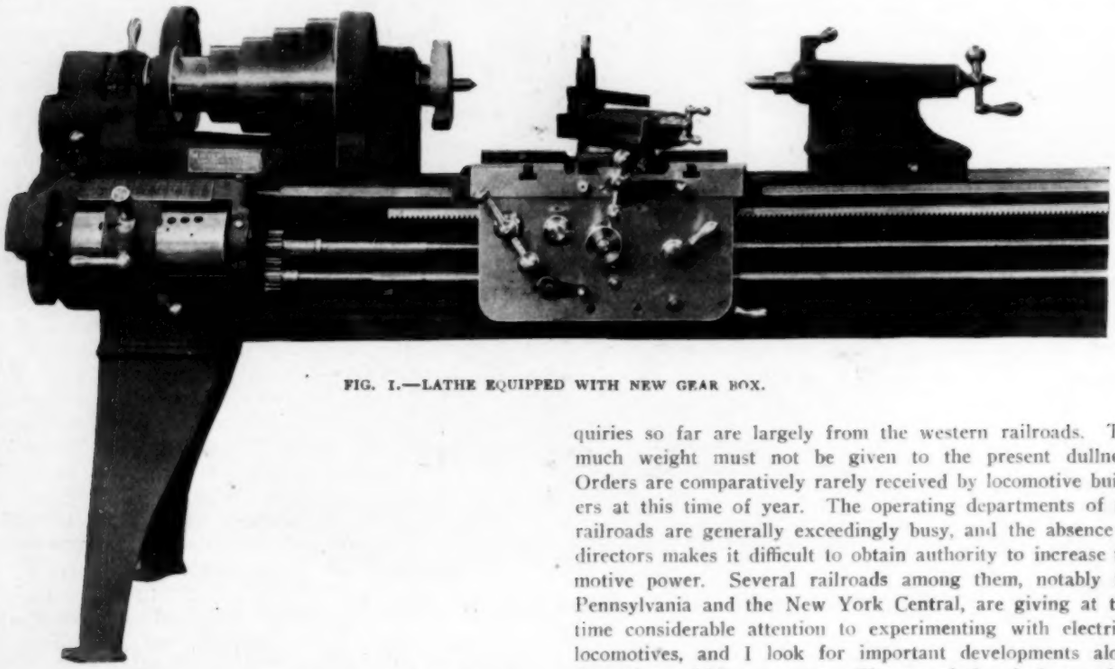


FIG. 1.—LATHE EQUIPPED WITH NEW GEAR BOX.

To change the speed it is only necessary to withdraw the locking pin from engagement with the holes in the stationary cylinder D, swinging the intermediate gear H and the carrier E about the bearing on D and opposite to the required gear in the cone and the parts may be at once locked in their new position by releasing the locking bolt.

The carrier has a key fitted to it and this works in slots milled in the cylinder. By this method the bushing E has to be in the right position longitudinally before it can be rotated and the intermediate thrown into mesh with any of the cone gears. This arrangement protects the device and it is impossible to throw the gears in mesh at the corners and run the risk of stripping the teeth. The slots are all milled at the proper depth so that when the carrier is thrown to the extreme position it is in accurate mesh for the pitch lines of each pair of gears.

A clamp screw binds the carrier in place and takes the strain off the locking pin. The lever seen at bottom of Fig. 2 and the corresponding gear fork at the lower portion of Fig. 3 are for the purpose of doubling the gear ratios. The gear box and supplementary gearing as applied to the lathe shown in Fig. 1 has a range of threads from three to forty-six per inch without any duplicates. This covers every standard thread, including the 11½ pipe thread. This entire range of threads can be obtained without stopping the lathe or removing a single gear. The feeds are four times the threads per inch. A slip gear on the lead screw permits the workman to disengage the latter and allow it to remain stationary except when thread cutting.

The whole arrangement is compact and simple. The gear mechanism from spindle to box is the same as is used on the regular lathes built by the R. K. LeBlond Machine Tool Co. with the exception of the telescopic gear on the stud. In this way the designers have avoided the compounding generally employed. The increase of the range of the speed box with the exterior gears has been arranged to bring the increased demand more directly into proportion with the gear capacity, the strain on the box being uniform irrespective of coarse feeds or heavy threads or as the builder asserts, "No harder on the feed box to chase four than forty threads per inch." Care has been taken to obtain the quick feed changes in the simplest possible manner to avoid undue friction and there are few parts. The feed box is provided with ample oiling facilities and the bearings are of generous proportions.

General Manager Alba Johnson, of the Baldwin Locomotive Works, says: "While the locomotive situation continues dull, there are indications such as increased inquiries, that the usual fall improvement in business is not far off. The inquiries so far are largely from the western railroads. Too much weight must not be given to the present dullness. Orders are comparatively rarely received by locomotive builders at this time of year. The operating departments of the railroads are generally exceedingly busy, and the absence of directors makes it difficult to obtain authority to increase the motive power. Several railroads among them, notably the Pennsylvania and the New York Central, are giving at this time considerable attention to experimenting with electrical locomotives, and I look for important developments along these lines within two years. The use of electric locomotives contemplated by the Pennsylvania and New York Central, is only at present for terminal purposes, but it is significant that they will employ electric engines powerful enough to substitute under these circumstances modern passenger locomotives. I believe that as a result of this use there will be such a gradual extension in the area of employment of electric locomotives as to give greatly increased importance to the latter."

C. B. Carter, of Knoxville, Tenn., who is organizing Supply and Machinery Dealers' Associations embracing Eastern, Northern, Central Missouri Valley and Pacific coast associations, has issued a pamphlet explaining his purposes and publishing letters of prominent machinery dealers endorsing his plan.

William M. Seger, an experienced patternmaker, formerly of Centralia, Washington, has purchased the pattern and model shop formerly owned and operated by E. J. Grenier, of Bellingham, Wash., and will conduct it in the future.

American Institute of Mining Engineers at Lake Superior Mines.

One of the pleasantest and most interesting sessions of the American Institute of Mining Engineers was that held last week and part of this one, with headquarters at Duluth and excursions to the iron region of Minnesota and the copper country of Northern Michigan. There were present, in addition to the administrative staff of the institute and a large number of prominent mining engineers, blast furnace men and others connected with the industry in America, a number of

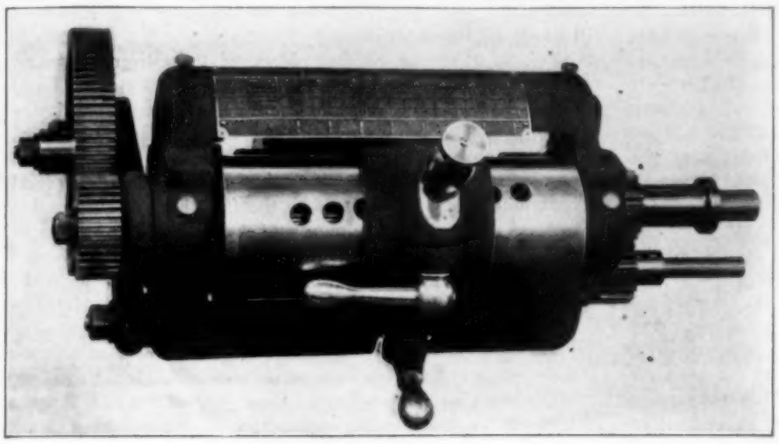


FIG. 2.—FRONT OF NEW GEAR BOX.

visitors from Germany, Russia, France and Mexico, of whom nine Germans were most prominent. These included the following representatives of the mining and metallurgical industries of the empire: Hans P. W. Mentzel and R. Goetze, Bochum, Westphalia; H. D. Klein, Dahlbruck, Westphalia; Fr. Koenig and Max Ludvig, Eisleben; W. Frentzel and G. F. Baum, Essen; Prof. B. Osann, Zollenfeld, Harz; Theo. Beckert, Breslau.

Sessions commenced Wednesday morning, in the rooms of the Duluth Commercial club, that had been thrown open for the occasion and were used for all sessions during the stay. After a short speech of welcome by the mayor of Duluth, and an address by Hon. Jos. B. Cotton, general solicitor for the United States Steel Corporation at Duluth, the reading of papers was taken up. Mr. Cotton felicitated the organization on its second visit to Duluth, and expressed the hearty pleasure and compliment that Duluth felt in receiving the guests. He added:

"Mining has been one of the controlling factors in the world's advancement. More than anything else has it added to the wealth of the world, more than anything else has it been a civilizer, has it made for the peace and prosperity of all the nations of the earth, and in all this work the mining expert, the mining engineer, has played his full part. Only thirty years ago Minnesota was unknown in the world of iron and steel. Her rich beds of iron ore lay all undiscovered in the lap of old mother earth. Today the fame of the Mesabi and Vermillion ranges is world wide, and Minnesota ranks first in the production of iron ore. The iron industry is one of the principal industries of our commonwealth, of our city and county, and of which we are justly proud. It gives employment to thousands of men and is aiding us to build up a virile young city.

"All this vast Western and Southwestern territory is ours—to conquer. We are at the head of it. With this great artery of interstate commerce at our very feet, the inland lakes, there are those of us who are not without the hope that we can make of Duluth a second Chicago as the great and glorious Northwest is built up; that we can make Duluth keep full pace with the giant tread of the nation itself.

"We are glad that you are with us again; we want to get acquainted with you and we want you to get acquainted with us. We know that we shall enjoy your visit here. We know that we shall be benefited thereby. We want to make Duluth a manufacturing center. We want the furnaces, the smokestacks and the manufactories. We want to hear the hum of unceasing activity. We want to see the wheels of commercial life go on and on in our midst, and somehow, some way, some day, we may call on you to help us make Duluth a Manchester or a Sheffield."

Tribute to Prof. Pettee.

Dr. Raymond read an appreciative biographical tribute to the late Prof. Wm. H. Pettee, who, he said, was more responsible than any man, living or dead, for the growth and success of the American Institute. He referred at some length to Dr. Pettee's painstaking accuracy in everything he undertook, to his wide knowledge and his deep information on every branch with which he came in contact, prefacing these remarks by a brief running account of his education, and how it fitted him for his later work in life. He spoke of the work of Prof. Pettee in making a regular ninth revision of the publications of the institute as they came along, and said that of the more than 1,000 publications and papers submitted for his revision, after eight prior readings, there had not been more than three accepted by him as correct. The speaker instanced a number of cases of corrections, showing the remarkable and almost superhuman work of the revisor. "He was to our work like the last second on a racing horse. It was the last second and the final touch of accuracy that made the value of the horse and the worth of the publications of the institute giving them precedence over any similar works issued by any society in the world."

A biographical tribute to Clement LeNeve Foster was also read, and it was announced by Dr. Raymond that, in future, on account of the large membership and the consequent increase in the number of deaths, these obituary notices would be confined to a limited number. In the last business year, he added, sixty members had been lost by death.

In the absence of the author, Chas. Morgan, of Worcester, Mass., the secretary read his "The Case of Henry Cort," a review of his puddling invention and the means by which he had lost it and his fortune as well, and had been reduced to beggary by the very government whose existence he had done

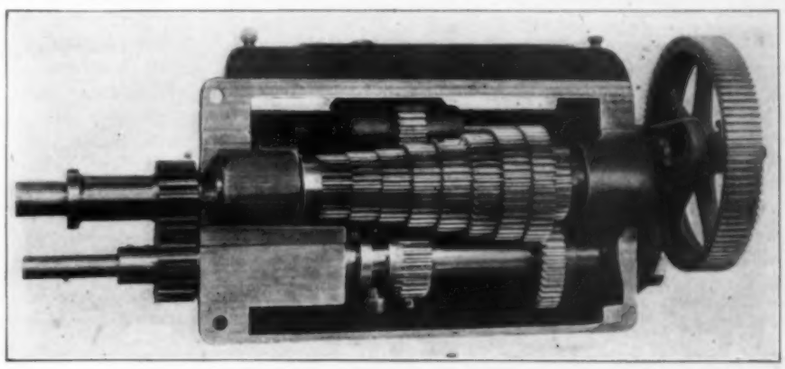


FIG. 3.—BACK OF GEAR BOX AS REMOVED FROM LATHE.

so much to save and whose wealth he had so marvelously increased. For the invention of puddling came at a time when England stood at bay, fighting for her colonial possessions, and with Europe against her, and when the admiralty was obliged to specify Swedish iron for naval purposes. As a result of this paper it is quite probable that a movement will be undertaken to place in Hampton churchyard, where Cort lies buried, a proper memorial tablet, the cost of which American ironmasters will be invited to defray.

R. V. Norris read his paper on centrifugal mine fans, which will appear in the proceedings. The secretary read the paper of Manager Gardner F. Williams, of the Kimberley diamond

mines, on the "Genesis of the Diamond." It will also be printed.

In the afternoon the party was taken to the United States concrete monolithic work at the south harbor pier, where is under way one of the most interesting and largest pieces of concrete construction yet undertaken. In the evening a reception was given the party at the house and grounds of the Northland Country club, one of the delightful clubs of the Lake Superior country.

Thursday morning a second session of the institute was held at which Mr. T. F. Witherbee, of Durango, Mexico, read a paper on "Special Forms of Blast Furnace Charging Apparatus." This was discussed by Messrs. B. F. Fackenthal Jr., Julian Kennedy, Prof. B. Osann and R. W. Raymond. Mr. Kennedy took up the matter of experiments with models of charging devices, and said that he thought them of little value from the fact that the models were of too small a size to prove much, and that actual charging into a full size bell was the only proper form of experimentation. No matter how successful the preliminary work of charging apparatus might be, the bell, if swung on a beam from the side of the stack, and thus sliding two or three inches in its opening, would vitiate all precautions. Prof. Osann said that a number of theories in charging furnaces had been exploited, "even in Germany," but that they had not been justified by results. He reiterated what had been referred to in the original paper, that the work of largest furnaces had not always been successful in showing greater economies and that they had not been able to reduce the fuel proportion of the charge nor the cost of production. His paper was in German. Mr. Fackenthal referred to the time when he and the president of the institute were together in furnace work and when Mr. Gayley had crawled into the furnace under the bell to study conditions of charging and that it was evident that sizes of ore and coal material going into the furnace had much to do with proper distribution inside. Dr. Raymond referred to the human side, and doubted if any device depending on the faithfulness of a man working far from any oversight, in a place where there might be unpleasant heat, or gas, or other difficulty, was always to be depended on.

Mr. D. T. Croxton, of Cleveland, read a paper in this discussion treating of the Alexander Brown revolving top, which was of much interest. The Cleveland furnace is fitted with a number of devices that put it in the front rank and some of these Mr. Croxton described.

Geology of the Pre-Cambrian Rocks.

C. K. Leith, author of the geological survey monograph of the Mesabi range, gave a condensed summary of the views of the survey on the geology of the pre-Cambrian rocks of Lake Superior, including the iron ranges. This was illustrated by a chart of the pre-Cambrian geological sequence, and by a geological map of the entire Lake Superior region north and south. It was listened to with the utmost attention and was appreciated by the institute. Prof. Leith advanced the views that have already been published by Dr. C. R. Van Hise and himself.

President Gayley introduced the discussion by the statement that United States Steel Corporation mined 80 percent of the ore of the Lake region, and naturally had in its employ many of the best men to be had, who deserved the highest credit for first hand geological work, and had been much aided by the reports, maps and records of the geological survey. He called on President T. F. Cole, of the Oliver Iron Mining Co. Mr. Cole wanted to note what the miner had done toward the development of the Lake Superior region, and said he was greatly aided by the United States survey, by our own geologists, and, in some cases, by the work of the state surveys. He thought geologists had said little of the part mining men had played in the development of iron ore deposits and in gaining information on formations. For his part he thought nothing was so good a way to get ore as to put down good, deep shafts, and plenty of crosscuts and drifts. He said that he expected to find ore in the Gogebic range at depths of 2,500 feet, far below any distance that had been looked on as possible ground.

Dr. N. P. Hulst, vice president of the Oliver Company, was called on and referred briefly to the work of drills and other methods on the Menominee range. President Gayley said the steel corporation controlled 16,000 acres in the Marquette range, 6,000 of which were on the ore bearing formations, though but a very few acres covered all the ground containing ore. He referred to the fact that the corporation had very extensive operations and wanted the experiences of practical men taken into account.

Thursday afternoon the party visited and lunched at the works of the Zenith Furnace Co., where are a blast furnace, merchant coal docks, Otto by-product plant for 300 tons of coke daily, auxiliary water-gas plant and other works. In the evening trains were boarded for trips through the northern Minnesota ore regions. There trains consisted of a full "Pioneer Limited "equipment of the Chicago, Milwaukee & St. Paul road, as fine a train as is on wheels in Northern America, and another of private and official cars of the Duluth roads. Members of the institute filled the former and part of the other, while prominent Duluthians made up the rest of the party. Both trains were tendered and hauled in compliment to the institute.

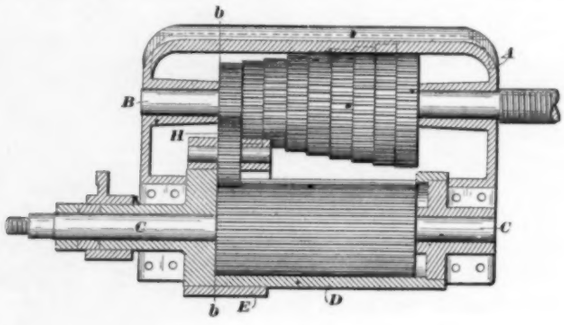


FIG. 4.—LONGITUDINAL SECTION THROUGH GEAR BOX.

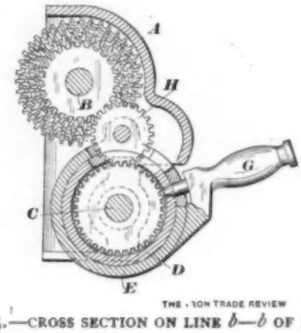


FIG. 5.—CROSS SECTION ON LINE *b*—*b* OF FIG. 4.

During Friday morning the Ely basin was inspected, with the steel shaft houses of the Pioneer, Sibley and Savoy mines, the highest and most elaborate of their kind in the world. Many of the party went underground at Pioneer, and inspected the novel application of the caving system as applied there.

Large Mines Inspected.

In the afternoon, the party reached the Biwabik and Duluth mines, the former a steam shovel property mining this year about 600,000 tons, the latter an open pit shaft property mining regularly about 150,000 tons. Biwabik is opened in the form of an immense horseshoe, 2,400 feet in longest diameter and 1,000 in shortest, and has not less than 75 feet of vertical thickness of stripping. It is operating with several shovels, and has a large reserve. The intimate connection between the wall rock of the chert and the ore was nicely shown here on the new side of the great pit.

Following these, the trains passed rapidly by several mining towns and stopped at the Fayal mine, which was looked over quite rapidly. Its development consists of two large open pits, one for tramming to a shaft, and the other wins ore both in that way and by steam shovel. A great stripping job of 2,000,000 yards is now under way to extend the shovel pit southward. The mine had at the opening of navigation some 600,000 tons on surface, most of which is now gone. It is not working heavily, producing about 30,000 tons a week.

Adams last year mined from underground 1,600,000 tons, the world's biggest record for a shaft mine. It is now developing a milling pit, where six mills were in operation on the second level at the time of the institute's visit. This was the first glimpse of a milling property and was very much enjoyed. From there the trains ran to Mountain Iron, where about 1,000,000 tons a year is being moved from an open pit. This mine is now opened a mile north and south and its greatest width is about 1,200 feet. Shovels are now working in the fourth level. During the coming winter the stripped area will be materially increased.

That evening was passed at Hibbing, and an impromptu entertainment was given for the party by those of its membership who were able to do stunts. Mr. Fackenthal was master of ceremonies, and a right good job he did. The versatile Dr. Raymond, numerous ladies of the party, Mr. Dwight, Dr. Hulst, Mr. "Rouletto" Struthers, the German chorus of nine members, Manager Amos Shepard, of the Stevenson mine and General Manager W. J. Olcott, of the United States Steel mines, astonished some of the company by their ability in lines aside from those professional. Several others took part in this delightful entertainment.

Saturday, mines about Hibbing were visited. First the Stevenson, which is now shipping at the rate of more than 1,500,000 tons a summer season. It is a trough running east and west, nearly a mile in longest diameter and containing about ten or twelve million tons of high grade Bessemer ore of remarkably uniform structure. In this uniformity of structure and chemical quality it differs from many large Mesabi deposits, where the chief trouble of the superintendent's existence is to keep to his guarantees. Stevenson was quite thoroughly inspected for the time allowed. Later in the morning the party went into the Mahoning, a vast oval opening, arranged with standard gauge tracks in spirals, to the third ore level. A Sunday quiet prevails at the Mahoning constantly, but the mine is good for an amount of ore far in excess of what it is mining, an average of about 1,000 tons a year. This year's product is somewhat below that. Later the Leonard, Tener and Monroe mines were inspected with much interest. The Burt Pool mine, open pit, steam shovel, now producing about 1,000,000 tons, was next looked into. It is arranged so that its mining costs are about as low as those of any property on the Mesabi. This completed the visit and the party returned to Duluth, inspecting on arrival the docks of the Duluth, Mesabi & Northern road, which are now handling about 950,000 tons a month.

Sunday night departure was taken, and Monday morning the institute again met in Houghton. The Lake Superior copper country and the iron mines of Ishpeming were inspected this week and from Ishpeming they go to St. Louis, where an adjourned session will be held. Many of those in attendance have already left for their homes.

The Exhibit of C. H. Bradley & Co.

The engine shown by C. H. Bradley, Jr., & Co., of Pittsburg, in block 52, Machinery building, at St. Louis, was originally developed by Willans & Robinson, of Rugby, England. It is a triple expansion engine, the steam ports and valves between the three tandem cylinders being located in the common piston rod. There are two sets of cylinders, the cranks on the common shaft being set at right angles. The engine on exhibition is used in the Exposition arc lighting service, and has the distinction over most American machines of being built in accordance with the metric system throughout. The condensing apparatus consists of a 2,000-square foot Worthington condenser, a Blake vertical, twin beam, air pump, and an 8-inch Worthington volute circulating pump. The vertical twin air pump was originally developed by the George F. Blake Mfg. Co. for marine service. There are two air cylinders placed side by side in a vertical position, with the steam cylinders directly above, the two piston rods being connected by a walking beam. A crank on the shaft of the walking beam operates the slide valve of a small cylinder, the piston of which is in reality the driving engine of the main steam cylinder valves. This is not a dry vacuum pump, but is intended to handle both air and the water of condensation. Its operation is noiseless and regular, the auxiliary valve mechanism giving complete and accurate control of the motions of the main pistons.

A NEW STEEL TIE.

A steel tie for railroad purposes has been invented and patented by F. W. Mettler, a consulting and constructing engineer of Cleveland. The tie is designed to be pressed from a flat steel plate and is estimated to weigh complete with fastenings 120 pounds.

The tie is seen in plan and elevation in Fig. 1 and other

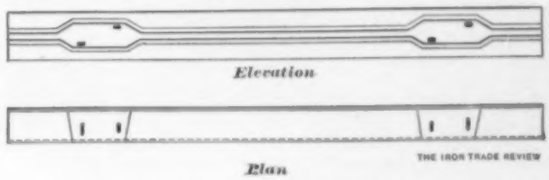


FIG. 1.—A NEW STEEL TIE.

views showing the fastenings and cross sections are illustrated in Fig. 2. The rail is fastened to the tie by means of a slotted clamp bolt. The head of the clamp bolt fitting the bevel of the flange at the base of the rail and the shank of the bolt passing through a hole punched in the top of the tie is locked in place by means of a beveled flat steel key. The beveled key bearing at the bottom edge of the slotted hole in the clamp bolt and at the top of the holes in the sides of the tie serves to draw the rail down to a solid bearing upon the rail. This key may also be locked in place by bending the projecting end of the key sideways.

The enlarged parts of the tie forming the rail seats also resist any tendency of the track to slip sidewise and spreading of the rails can only take place by shearing off the heads of the clamp bolts. These ties will outlast wooden ties in the proportion of three to one, in Mr. Mettler's opinion, and will

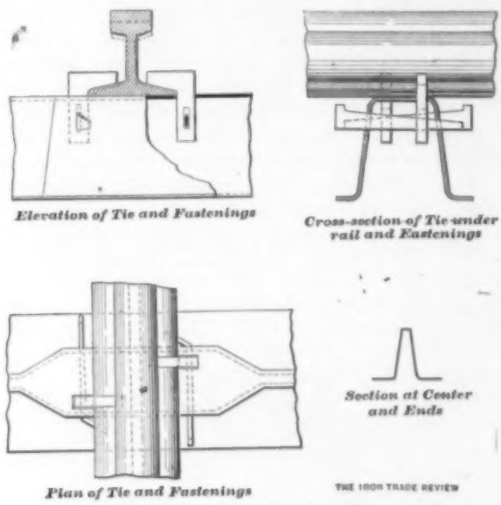

Elevation of Tie and Fastenings
Cross-section of Tie under rail and Fastenings
Plan of Tie and Fastenings
Section at Center and Ends
THE IRON TRADE REVIEW

FIG. 2.—METHOD OF FASTRNING RAIL TO STEEL TIE.

still have a scrap value when they must be replaced in course of time.

The ties may also be riveted to the flanges of bridge stringers or girders which would prevent the wearing away of the paint between the ties and the stringers as is the case with wooden stringers and the consequent deterioration of the flanges.

The report of a bond issue to take up the floating debt of the Republic Iron & Steel Co. has been revived in a more definite form. Officials of the company decline to discuss it, but from bankers who have been carrying the company's paper comes the statement that steps are being taken to make a bond issue and pay off the floating debt. The matter will probably be submitted at the annual meeting, Oct. 19. President Forgan, of the First National Bank of Chicago, states that all that can be said at the present time is that the plans for financing the company have not matured. He is of the opinion that the company will not need $10,000,000, a figure that has been frequently named in reports concerning the bond plan.

THE BURNHAM HYDRAULIC PUMP.

The Burnham hydraulic pump is in general appearance very much the same as other machines for a similar purpose, but there are features embodied in its construction that will appeal to the proprietor. It is claimed that the pump, whilst not radically different from other pumps in exterior design, is yet so arranged at the steam end, the steam valve and auxiliary mechanism so proportion that the machine works safely and smoothly when the load is suddenly removed. The Electric Railway Equipment Co., of Cincinnati, has had seven pumps of this make in operation in its plant at Etna, Pa., and reports that all governors have been removed from them and complete reliance is placed upon the valve mechanism already mentioned.

The halftone, Fig. 1, shows the Burnham pump, Fig. 2 is a longitudinal section and Fig. 3 depicts horizontal and vertical

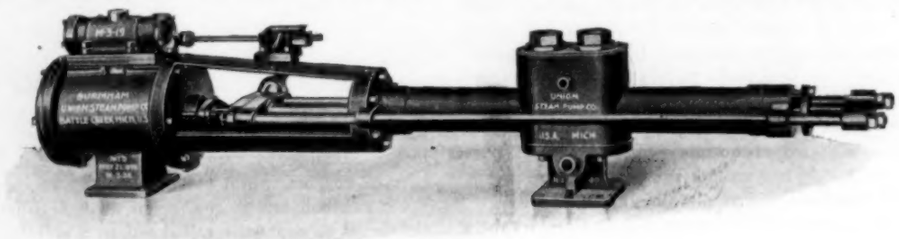


FIG. 1.—THE BURNHAM HYDRAULIC PUMP.

sections, presenting the steam cylinder, steam chest and valve construction. The steam end is controlled by a flat faced valve operated by a piston shown on top of the steam cylinder. This valve piston is controlled by an auxiliary slide valve which is placed on the side of the cylinder. The stems of this auxiliary valve H are placed on either end of it, passing through stuffing boxes so that the pressure will be the same on either end of the auxiliary. This prevents the valve from crawling out of a positive position at each extremity of the travel. One end of the valve stem extends out to about the center of the yoke, passing through the cam blocks which are operated by a cam lever engaging the crosshead attached to the steam piston rod. The cam and the cam blocks are so designed that the necessary lost motion may be obtained and the passing and movement of the piston from one end of the stroke to the other does not engage the cam blocks until nearly the end of the stroke. At the end of the stroke the cam engages the cam blocks and throws the auxiliary valve H into its proper position to relieve one end of the main valve

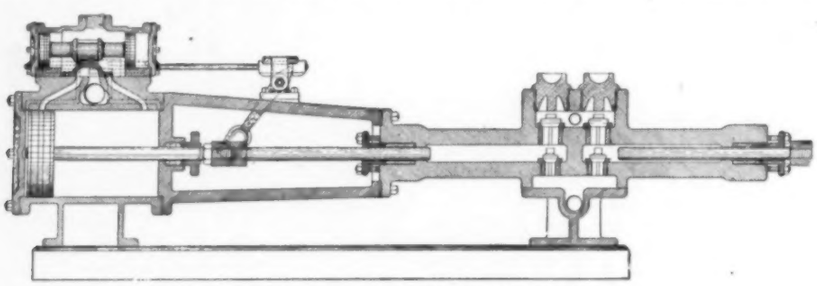


FIG. 2.—SECTIONAL VIEW OF THE BURNHAM PUMP.

piston and give it steam on the other. The main steam ports are indicated by E, G is the controlling valve perforated with openings S for the steam admission. The main steam piston is driven the full length of the stroke and this characteristic of the pump ensures a small clearance and corresponding economy. The valve will be seen to have an extension over the steam openings and these lips are perforated with steam openings S to admit the proper amount of steam for the work. It is found that this restriction proves a factor of safety of considerable value and that it is impossible for the pump to come to injury by the carelessness of the engineer in handling the throttle or any oversight of the workmen which might break the suction or instantly release the delivery.

The manufacturer, the Union Steam Pump Co., of Battle Creek, Mich., tests the machines under load up to the number of pounds pressure for which they are designated and runs them to within 1 in. of the end of stroke. Under this test the suction is broken, load instantly released, and the other conditions produced which presumably could occur to the pump in ordinary use. The trial is a rigorous one and fitting for the exhibition of any latent weakness. The water end of the pump is similar to those in ordinary use, though it is believed by the builder that the amount and strength of material in body and in valve are fully up to the standard or exceed the regular grade of metal.

Men and Machinery.

President Elliot of Harvard says, "A man ought not to be employed at a task which a machine can be made to perform."

In the same vein the *Michigan Tradesman* says, "Every business plant has been made more profitable by the substitution of accurate, automatic machinery for hand labor and this not only, but later by the replacing of old machinery by improved machinery."

Again in the same line, the Cash Register people write that for inventions and for patents to protect the result, they spend about $90,000 a year.

A slight variation of the same theme was expressed by the manager of one of our large industries, to-wit, they wished only such workmen as are fit for and on the lookout for promotion. This rule with them, he adds, is invariable.

The upshot seems to be that nothing in factory work is done right until it is done well, as quickly and as cheaply as the best equipped man with the best equipped machine can do it, until the maximum of work is turned out at the least cost and with the least waste.

No machine should live if another—a new one—could do more or better work. No hand labor should prevail if a machine can be devised to take its place, and no machine should be run and no one allowed to run it, who could not extract from his machine its biggest and best daily output. —[J. A. Walker in Graphite.

The Sandage Steel Skein Co., New Albany, Ind., recently placed in the hands of a receiver, will in all probability pay its creditors in full. This is the statement of the receiver, Gabriel R. Summers. The indebtedness of the company is about $50,000.

The Detroit Steel Products Co., 89-99 Fort street, east, Detroit, is now ready for business in automobile springs. Ordinary carriage springs are not suitable for automobile use and in order to meet the requirements of the automobile trade, springs are made of carefully selected steel. Each spring is dated and registered and absolutely guaranteed.

NEW USE FOR THE GYROSCOPE.

The utility of the gyroscope, the well known device for exhibiting the inertia of rotating bodies, has been mainly confined to a few toys—the spinning top, for example—and some experimental apparatus for research work upon the action of rotating bodies. Foucault designed a very delicate instrument of the latter class for showing the motion of the earth. The industrial applications of the gyroscope have been limited to but a few forms and these to such purposes as the balancing of the load in the baskets of extractors rotating at high speeds and some governors of prime movers. Latterly the tendency of the gyroscope to maintain a definite position against exterior forces has been applied to models of vessels with a view to more general application for marine work, and in a paper by Schlict the practical possibilities of such a plan are presented in a way to give some hope that much of the rolling motion of sea-going ships may be diminished.

Another field of usefulness for the gyroscope comes in a report from France. This briefly tells of a device applicable to the ordinary sextant employed by ship masters for the determination of their position on the seas and doing this by measuring the height of the sun or a star above the horizon.

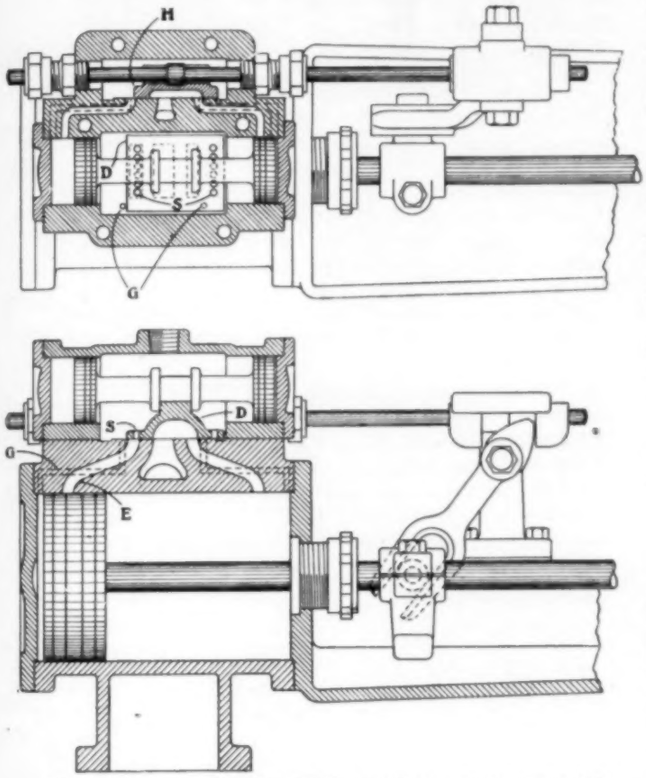


FIG. 3.—SECTIONS SHOWING STEAM CYLINDER, STEAM CHEST AND VALVE CONSTRUCTION.

In clear, sunny weather the horizon is easily visible and the task of observation comparatively easy but at night or in haze or fog during the day the horizon is obscured and the height of the star or sun is not to be determined though the latter may be visible. An artificial horizon has been attempted on board the vessel by means of various expedients. The rolling motion of the vessel has prevented these having much success up to the introduction of the sextant with gyroscopic improvement. This comprises a small air turbine mounted on the sextant held by the observer in the ordinary way. The turbine is about 1 in. diameter and runs on a vertical pivot like an ordinary spinning top and at about 100 rotations per minute. At this speed the turbine axis tends to a vertical position. There is a lens and an illuminated scale which presents a horizontal line or an artificial horizon to the telescope. The turbine is first brought up to speed by a small exhaust pump. The air in the turbine chamber is then partly exhausted and the turbine runs in the partial vacuum. The pump is then disconnected and it is claimed that the turbine will spin along for many minutes before re-pumping is necessary. The center of gravity of the turbine is about half a millimeter away from the pivot point support and the turbine at rest acts as a very short pendulum. The gyroscopic action under the influence of rapid spinning changes the turbine movement to that of a very long pendulum with slow swing. The limits of the swing are noted in each observation to obtain the true horizon. The *Electrical World* suggests the replacing of the pneumatic driving power of the instrument by electric power from a storage cell.

Sloss-Sheffield Steel & Iron Co. Report.

Considering the unfavorable conditions under which the Sloss-Sheffield Steel & Iron Co. has operated for several months, the statement made for the August 31 quarter is considered favorable. During July and August the company was obliged to use drift coal from its three mines, as the union miners were on strike. This class of coal gave an inferior quality of coke. Since the strike has been on, the earnings, of course, have been cut down in other ways. Notwithstanding the strike under July and August and the extreme dullness which has prevailed in the iron trade for a considerable part of the present calendar year, the company is in a strong financial condition. The report issued showed a total surplus on Sept. 1 of $2,441,000.

The report for the quarter (August estimated), is as follows, compared with the like report of a year ago:

Profit from oper.....	$ 214,815	$ 364,927	Dec. $150,112
Depreciation, repairs and renewals	.....	37,601	Dec. 37,601
Net earnings	$ 214,815	$ 327,326	Dec. $112,511
Interest 3 months	52,500	52,500	
Taxes 3 months.....	7,500	7,500	
Total charges	$ 60,000	$ 60,000	
Net profits	$ 154,815	$ 267,326	Dec. $112,511
Div. pref. stock.....	114,000	114,000	
Surplus	$ 40,815	$ 153,326	Dec. $112,511
Actual sur. June 1.....	2,400,395	2,071,717	Inc.. 328,678
Total surplus	$2,441,210	$2,225,043	Inc.. $216,167

The directors have declared the regular quarterly dividend of 1¾ percent on its preferred stock, payable Oct. 1. Books close Sept. 21 and reopen Oct. 3.

Self-Hardening Steel vs. High-Speed Steel.

In a paper on "Alloy Steels," read by Mr. Wm. Metcalf at the Atlantic City meeting of the American Society for the Testing of Materials, and reproduced in the August issue of the *Iron and Steel Magazine*, the author would draw a sharp distinction between ordinary self-hardening or Mushet steel and those special steels now known as high-speed steels. "The present high-speed steels," the author writes, "are in no sense of the word air-hardening." And we find this opinion shared by other metallurgists and engineers. To us it seems, however, that no such distinction can be made between these two varieties of steels. Mr. Metcalf himself tells us that the discovery of high-speed steel resulting from the overheating (possibly accidental) of some ordinary self-hardening steel. This treatment, which had hitherto been considered ruinous when applied to self-hardening steel, resulted in imparting to it those wonderful high-speed qualities now so well known to our readers. By this treatment the self-hardening steel was converted into a high-speed steel. We want no more conclusive evidence of the fact that no sharp demarcation can be drawn between self-hardening and high-speed steel. It may be that, as at present manufactured, the high-speed steel differs materially in composition from Mushet self-hardening steel. It may be that the proportion of tungsten has been increased and that of manganese lowered, or that in some brands the tungsten has been replaced by molybdenum. The fact remains, nevertheless, that, to all tungsten steels of the self-hardening variety, if properly treated, high-speed qualities may be imparted. By altering the composition as pointed out above, these high-speed qualities may be intensified, but the difference between the two varieties of steels remains at best one of degree, not of kind.—[Iron and Steel Magazine.

THE AMERICAN PNEUMATIC RIVETER.

The American Air Tool Co., of Dunkirk, N. Y., has a pneumatic riveter which is shown driving ½-inch rivets in Fig. 1. The riveters are comparatively light in construction and all parts are easily accessible with but very little labor. They have an additional advantage in the complete enclosure of all the mechanism and are thus absolutely safe in operation. The frame may be detached from the cylinder and with any one cylinder a large number of frames of different size, gap or reach can be used for an extensive variety of work.

Fig. 2 shows a cross section through the cylinders and frame, and Fig. 3 presents an end view of cylinder and plan of valve face as well as sectional views of the auxiliary cylinder. The valve is placed on the side and toward the rear of the small cylinder and the air in making the compression stroke on a rivet is forced to the rear of both the large and small cylinders through the openings indicated by arrows on the cylinder views in Fig. 3. In order to release the pressure

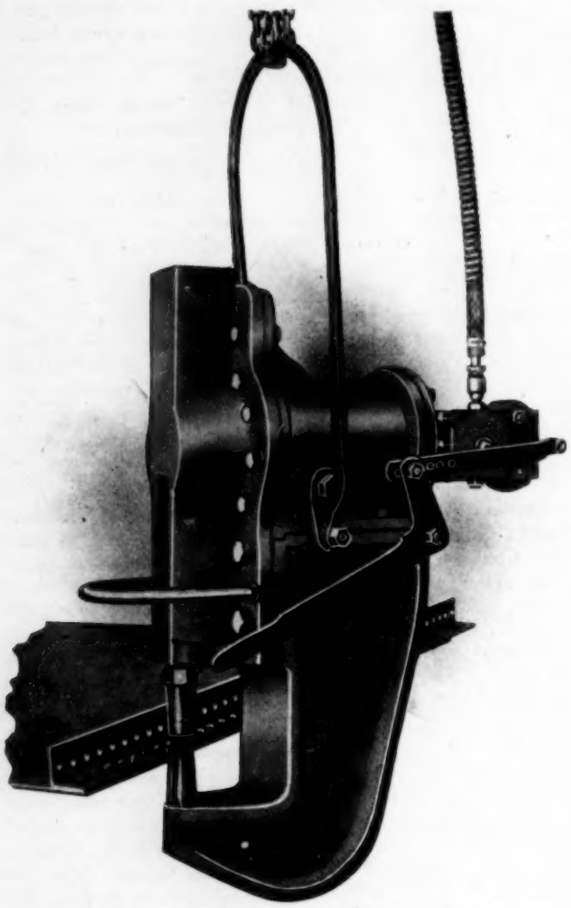


FIG 1.—THE A MACHINE DRIVING ½-INCH RIVETS.

on the rivet and return the piston and plunger to first position, the lever shown in Fig. 1 is reversed and the air allowed to escape and air pressure is forced in front of the small cylinder as shown by the arrow. The joints of the rocker and the connecting rods are encased in hard steel boxes or thrust bearings which take all strain off the pins.

One of these riveters is said to have been at work ten hours a day regularly for eight months without a single repair being made. This machine was employed on tank work. For long reach and small gap as is requisite for tank work, the company makes a structural iron frame of angle iron or rolled section. This gives a very light construction and the total weight of the tool is then much less than is common for machines of this class. This frame can be attached to any of the cylinders made by the firm and will handle rivets up to 1¼ inches. The largest size, or D machine, has been in use by the American Locomotive Co. for riveting up mud rings and has had a thorough test for nearly three years. This work, the riveting of mud rings in locomotives, was formerly done by hydraulic presssure. The machine is so arranged that for small shops equipped with a supply of compressed air of 100 pounds pressure it is able to take care of any boiler or other work now done by hydraulic riveters.

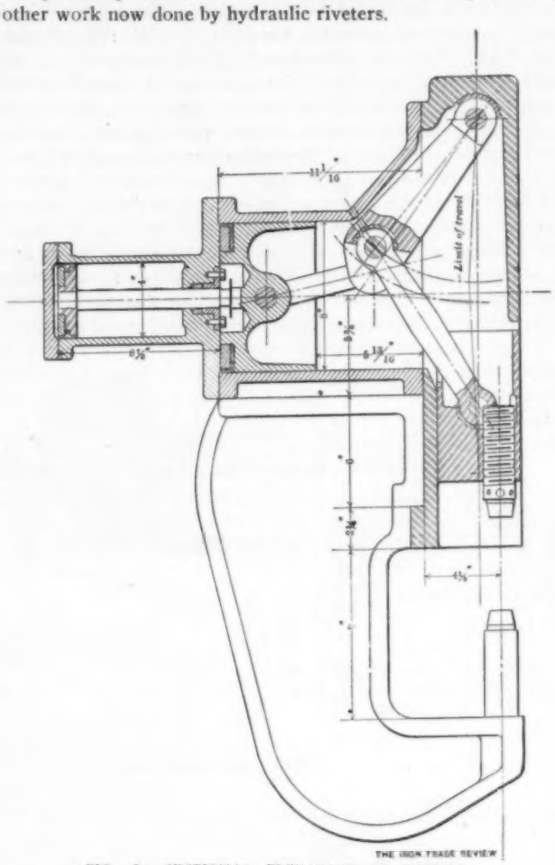


FIG. 2.—SECTIONAL ELEVATION OF RIVETER.

The D machine will drive 1⅛-inch and 1¼-inch rivets, 5½ inches long, in mud ring work, forming a perfect head, filling hole full length and making a sound joint. With this machine a pressure of 100 tons is exerted with 100 pounds of air. The machines are made in four sizes, A to D, for ½-inch rivets and under; for ⅝ and ¾-inch rivets; for ⅞ and

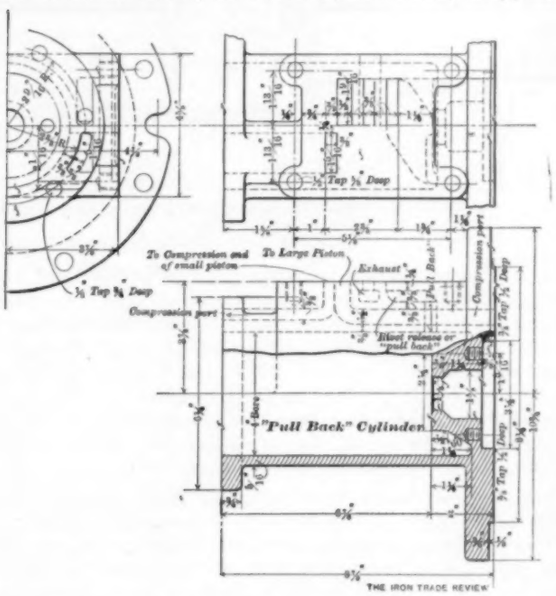


FIG. 3.—END VIEW OF CYLINDER, VALVE FACE PLAN AND SECTION OF AUXILIARY CYLINDER.

1-inch rivets and for 1⅛ and 1¼-inch rivets respectively. The A machine is illustrated in Fig. 1. The stroke of plunger in the several sizes is as follows: 3½, 5¼, 7 and 7 inches. All parts are interchangeable.

OBITUARY.

Philip W. Moen, of Worcester, Mass., died on the evening of Sept. 12 at his summer home in Shrewsbury, Mass. Death was due to apoplexy and came without the slightest warning. Mr. Moen was within a few days of being 47 years of age. He was the son of Philip L. Moen, one of the pioneers of the old Washburn & Moen Mfg. Co. He graduated from Yale university in the latter part of the 70's and then went to Sweden for three years, prior to entering the Washburn & Moen plant, now the Worcester works of the American Steel & Wire Co. In Sweden he supplemented his education which, with the practical experience that followed, made him recognized as one of the authorities of the country on the metallurgy of iron and steel. He was especially skilled in the manufacture of wire products. His technical education in Sweden being completed, Mr. Moen returned to this country and entered the Washburn & Moen plant. He first devoted his attention to the cost department, which was developed under him, and has since acquired a reputation as an ideally conducted cost department. After that he went into the purchasing department, and then became the assistant treasurer. In 1885 Mr. Moen took the place of Charles H. Morgan as superintendent, and was shortly afterwards made a director of the Washburn & Moen Co. Upon the death of his father in 1891, Mr. Moen became general manager. Like his father before him, Mr. Moen was a great favorite with his employes. When the Washburn & Moen Co. was absorbed by the American Steel & Wire Co., Mr. Moen was made a vice president of the parent company, and also the eastern manager for the company, retaining also his title as general manager of the Worcester plant. Two years ago, or shortly after the United States Steel Corporation absorbed the American Steel & Wire Co., Mr. Moen resigned from the company, and has since devoted his time largely to his farm near Shrewsbury, in which he was intensely interested, and to business, church and club interests in Worcester. Mr. Moen leaves a wife and three children.

Charles Wells died Sept. 14 at his home in Rochester, N. Y., in his seventy-ninth year. He was the organizer of the firm of Charles Wells & Sons, manufacturers of edge tools and iron and machine forgers. He retired from business in April.

Industries of Pennsylvania.

The bureau of industrial statistics of Pennsylvania has completed its annual report for 1903. The five leading industries of Pennsylvania, iron and steel, pig iron, anthracite coal, bituminous coal and tin plate are summarized as follows:

Total production in tons, 182,656,843; number of workmen employed, 435,774; aggregate wages paid to workmen, $241,677,718; market value of production, $774,963,777. The report states that notwithstanding the loss of many plants on account of removal from the State, going out of business and failures the returns from the 734 plants reporting to the bureau show that the year 1903 was a prosperous one. The total market value of the 16,567,013 gross tons of iron and steel produced during the year was $458,097,248.

The total number of persons employed in the production of anthracite coal was 159,985. The total earnings received by the anthracite wage workers amounted to $78,391,632. In the anthracite and bituminous coal fields the total tonnage amounted to 65,708,954 tons. The market value at the mines amounted to $283,089,936 and the earnings of the 317,940 persons employed were $157,250,134.

In 1903 the capital invested in the tin plate industry of Pennsylvania was $7,942,754. The average number of persons employed in this industry during the year was 8,261. Their earnings amounted to $5,696,188 and the total production of tin and terne plate 554,234,702 pounds.

At a meeting of the directors of the Crucible Steel Co. of America held at Pittsburg, Tuesday, Sept. 20, it was decided to mail a circular letter to the stockholders of the company explaining in full its present standing. A plan for the floating of the company's indebtedness has been promulgated. The company's annual meeting will be held on Oct. 19.

STANDARD SPECIFICATIONS.

A meeting of Committee A, of the American Society for Testing Materials on Standard Specifications for Iron and Steel, was held on the 17th of September at the House of the American Society of Civil Engineers, for the purpose of meeting Mr. Leslie S. Robertson, secretary of the Engineering Standards Committee of Great Britain. Dr. Charles B. Dudley, president of the American Society for Testing Materials, occupied the chair. There were present at the meeting as guests of the committee, a number of chairmen of committees of other societies concerned with work of a similar nature.

The chairman having called upon Mr. Robertson to explain the work of the committee, he briefly touched upon the work being carried on by the committee and the methods adopted by it. It appeared that the committee was first formed at the instigation of the Council of Institution of Civil Engineers to consider the advisability of standardizing rolled sections. The work of the committee gradually grew in scope and importance, and various new subjects were added from time to time. Mr. Robertson explained the constitution of the committees, and the representative nature of their membership. The committees are so constituted as to embody in them representatives of all the various interests affected, and where possible, this representation has been secured by official nomination and not by private selection. Various scientific bodies and trade associations have co-operated with the committee in its work. These specifications have been carefully discussed by the engineer and manufacturer meeting around the table of the institution, where any conflicting interests have been, as far as possible, amicably harmonized. The committee has published several reports, one of the most important being that on Standard Test Pieces. The test pieces decided upon by the committee appear to go a long way toward solving the difficulties surrounding this much debated question. The test pieces were arrived at after the most careful investigation by several of the committees, and after exhaustive experiments by Professor Unwin and others.

Various speakers expressed their approval of these standard test pieces and their conviction that their general adoption in this country would mark a distinct step forward. It was the sense of the meeting that substitution of these standards for those now prevailing in this country was desirable.

It appears from Mr. Robertson's remarks that the standards committee has a large amount of valuable work in hand, and as the committee is supported by the British Government and the five leading technical societies in Great Britain, the results of its work will be awaited with great interest by the engineering profession not only in Great Britain but also in this country.

It will be seen from the foregoing that the British engineering standards committee is proceeding on lines quite similar to those followed by the American Society for Testing Materials. Both recognize the desirability of according representation on their committees to all parties in interest, including the manufacturers. The work is distributed among numerous sub-committees whose reports are submitted to the parent committee for revision and adoption.

Mr. Robertson is expected to meet members of several of the committees of the American Railway Engineering Maintenance and Way Association, engaged on similar subjects at a special meeting in Chicago on September 29.

The discussion of the general subject of standardization of methods of testing and of specifications governing the materials of construction, will be continued at the International Engineering Congress in St. Louis, October 3-8.

The statement of La Belle Iron Works for year ended June 30, 1904, is as follows: Assets—Total properties, $8,251,288; patterns, $14,770; treasury stock, $140,142; suspended bills, $29,200; prepaid interest, $55,401; inventory, $1,326,675; bills receivable, $19,975; accounts receivable, $635,567; cash, $147,040; total, $10,588,062. Liabilities—Capital stock, $7,000,000; bonded indebtedness, $2,500,000; bills payable, $193,526; accounts payable, $311,325; payroll, $63,373; accrued interest, $25,641; contingent fund and maintenance account, $32,203; profit and loss surplus, $461,991. Total, $10,588,062.

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SEPTEMBER 22, 1904

STEEL CORPORATION FINANCE.

The report that the United States Steel Corporation contemplates exchanging the remainder of its preferred stock for bonds was probably invented to excite an influence on the stock market, and particularly to disconcert the "Short Interest," which is reputed to have been born in steel making circles when the preferred stock was selling in the fifties. It is worth while, however, to consider the present alignment of the corporation's securities and note how curious such a procedure would be with the present outlook. The present outstanding obligations are approximately as follows: Subsidiary company bonds, including about $40,000,000 Union and $13,000,000 Clairton, $115,000,000. First mortgage bonds, $303,917,000; second mortgage, including $150,000,000 exchanged for preferred stock, $20,000,000, issued for cash, $1,000,000 issued for Troy Steel Products Co., and $1,000,000 issued for Clairton Steel Co., $172,000,000; total bonds, $590,917,000. Preferred stock, $360,281,100; common stock, $508,302,500; grand total, $1,459,500,600.

The total of bonds includes roughly $10,000,000, held by trustees of sinking funds, which will continue to bear interest until maturity and are therefore properly included in the total, their earnings being necessary to the final discharge of the obligations. There remain in the treasury, executed and certified but not issued, $28,000,000 of second mortgage bonds, being the remainder of the $50,000,000 intended to have been issued for cash. While $50,000,000 authorized to be issued for preferred stock have not been executed, a total of $78,000,000, as compared with $360,000,000 of preferred stock, remain to be retired. The undesirability of an issue of third mortgage bonds aggregating nearly $300,000,000 can hardly be questioned. The added security of a third mortgage bond as compared with preferred stock would be quite shadowy. The value of a bond lies in its foreclosure rights, yet in the case of the second mortgage bonds, already outstanding, this right has been markedly abridged by requiring default in interest for two complete years before proceedings can be instituted. To attempt to establish a third issue without a similar provision would undoubtedly result in equity proceedings by the second mortgage bondholders, while to establish a longer period would give the third mortgage bondholder practically nothing at all in the way of security. For this intangible advantage the preferred stockholder would have to be asked to content himself with a lower possible rate of return on his holdings and to surrender his voting rights.

Besides all this, the right to immediate foreclosure would be of extremely doubtful value, since it would require the assumption, at face value, of $590,000,000 of prior obligations. The preferred stockholder would most naturally prefer to retain his right to vote, and his right to 7 percent instead of 5 percent, if it is earned. To the holder of common stock the increased potency of his vote would be of minor consequence. The value of the voting power is ephemeral and is small except in the event of a contest.,

The real hope of the common stockholder is not for any share of earnings in present years, but rather that the corporation may grow at some pace comparable with the wonderful growth which the steel business has heretofore shown. Such a growth would be hindered, if anything, by the substitution of third mortgage bonds for preferred stock. A suspension of preferred stock dividends could contribute to such growth in a way impossible if that security were replaced by a bond, of whatever character, as in one case the corporation would be free to expand its capacity and scope, and in the other case it would not be.

Colorado Fuel and Iron Co.'s Plans.

The following notice to stockholders of the Colorado Fuel & Iron Co. was sent out Sept. 16:

"The annual meeting of stockholders for election of directors and transaction of general business will be held in the Boston building, Denver, Monday, Oct. 17, at 2 p. m. The stock transfer books will close Tuesday, Sept. 27, and remain closed until final adjournment of the meeting.

"The properties lately sold by this company to stockholders and directors have now been conveyed to the Colorado industrial committee which also purchased from the Wyoming Railway & Iron Co. large deposits of iron ore in the state of Wyoming and has arranged for the acquisition of over seven-eighths of the outstanding debentures of the Colorado Fuel & Iron Co., issued under agreement with the Illinois Trust & Savings Bank. Certain directors of the Colorado Fuel & Iron Co. are also interested in the Colorado Industrial Co.

"It is now proposed to bring all the properties together under the control of the Colorado Fuel & Iron Co.; to refund the outstanding first mortgage bonds of the Colorado Fuel & Iron Co. and to furnish that company with what is believed to be ample working capital. For all these purposes and by order of the board of directors there will be brought before the meeting a proposition to amend the articles of incorporation of the Colorado Fuel & Iron Co. so as to increase the capital stock of the company from $40,000,000 to $46,200,000. There will also be submitted a proposition to acquire the capital stock and part of the bonds of the Colorado Industrial Co., a corporation existing under the laws of Colorado, in consideration therefor this company to issue $6,200,000 par value of its capital stock and to guarantee the mortgage bonds of the industrial company to an aggregate amount of $45,000,000.

Bulletin No. 17, issued as a supplement to the Crane catalogue of the Northern Engineering Works, Detroit, Mich., illustrates several types of overhead electric-trolley hoists made by that company. This firm also builds a number of types of pneumatic hoists, and a complete line of overhead tracks, switches, and turn tables.

SPECIFICATIONS FOR STRUCTURAL STEEL.

The following appears in substance in *Engineering* in discussion of the proposal to adopt standard international specifications for structural and rail steels:

Although British and Continental engineers, since the use of mild steel commenced, have chiefly employed only one grade of the material, such has not been the case in America, where, until quite recently, two grades—viz., soft steel and medium steel—were almost universally specified by engineers, the grade selected depending, of course, on the special duty which the steel had to perform. If we look through the specifications for structural steel drawn up by any of the leading American engineers, or bridge builders, we find that the two grades—soft and medium—are always mentioned, and are used for distinct purposes, in a way which points to a strong faith in their different qualifications. Take, for instance, the American Bridge Co.'s general specifications for steel highway bridges. In this there are both soft and mild steel specified, and, in addition, a quality of steel of an extra ductile quality, to be used for rivets. For soft steel the ultimate strength ranges from 52,000 pounds to 62,000 pounds per square inch, with an elongation 25 percent in 8 in., and it is required that a test piece shall stand bending 180 degrees flat on itself, without fracture. For medium steel the ultimate strength is fixed at from 60,000 pounds to 70,000 pounds per square inch, the elongation 22 percent, and the bending test 180 degrees to a diameter equal to the thickness of the test piece, without fracture on the outside of the bent portion. For rivet steel an ultimate strength of 48,000 pounds to 58,000 pounds per square inch is specified, with an elongation 26 percent in 8 in., and a bending test of 180 degrees flat on itself, without fracture on the outside of the bent portion.

Now in English practice there is usually only one grade of steel used for structural purposes, and that grade corresponds very closely with the medium steel used in America; it is specified to have an ultimate tensile strength of from 27 to 32 tons per square inch, with an elongation, measured in a length of 8 in., of not less than 20 percent.

It is also usual to specify a bending test, such that a specimen piece shall, when heated to a cherry red and cooled in water having a temperature of 82 degrees Fahr., bear bending double, when cold, round a curve, the diameter of which is not more than one-and-a-half times the thickness of the piece, without showing any signs of fracture. Rivet steel is, as in America, usually specified of a softer kind, and must have an ultimate tensile strength of from 26 to 30 tons per square inch. It must also be capable, when cold, of being bent double on itself without showing signs of fracture.

Of late years a feeling has grown up among American engineers that the "soft steel" usually mentioned in their specifications might very well be omitted, because the limits mentioned for the two classes of steel—both "soft" and "medium"—always overlapped in the higher limit for the "soft" steel and the lower one for the "medium," and because both grades of steel could be made from the same ingot, and were practically alike. The American Bridge Co. fix the limit for soft steel at from 52,000 pounds per square inch ultimate tensile strength to 62,000 pounds, and for "medium" steel from 60,000 pounds to 70,000 pounds. Mr. Theodore Cooper specified, in 1901, a range of from 54,000 pounds to 62,000 pounds for "soft" steel, and from 60,000 pounds to 68,000 pounds for "medium" steel.

At a meeting of the American Society for Testing Materials, held at Atlantic City last year, the question as to the desirability of specifying a single grade of open-hearth structural steel for bridges of ordinary span was discussed by some of the leading bridge designers and builders, and the matter very fully gone into, with the result that the general opinion of these engineers appears to have been that it was desirable to specify in future only one grade of steel for structural purposes, rivet steel, of course, not being included in this. The wisdom of this decision will appeal to English engineers who in their practice have always been satisfied with one grade of steel, having an ultimate tensile strength ranging from 27 tons to 32 tons per square inch.

Another argument in favor of the adoption of one grade of steel in America appears to be that at present a large percentage of the structural steel is made by the basic process, and it seems probable that this process will be the one of the future for ordinary structural steel. There is a prejudice against basic steel in certain quarters in this country, which prejudice we do not consider is supported by facts; but in America no such feeling exists; basic steel, having an ultimate strength of from 58,000 pounds to 60,000 pounds per square inch, if properly manufactured, being looked upon as a highly satisfactory material for structural purposes. There is another argument also in favor of one-grade steel, which is, that by its adoption a more uniform practice all over the world may be established, and engineers who issue eccentric specifications will not receive much consideration from steel manufacturers.

Granting the advisability of adopting one grade of steel, the question has arisen among American engineers as to what is the proper grade of steel to use. Much discussion has taken place on the subject in the States, and most of the leading engineers there have expressed themselves on the subject, some arguing in favor of a continuation of the use of two grades of steel, while others (and they the majority) advocate strongly the adoption of only one grade, and that of the higher quality. After all, however, when the views of these men are examined and compared, there seems to be a wonderful unanimity. The prevailing impression left in the mind is that it is a case of Tweedledum and Tweedledee, and that the most suitable steel to adopt is one having an ultimate average tensile strength of about 60,000 pounds per square inch. The other properties of the material, such as the yield point, and the percentage of elongation, to be fixed to suit this range of tensile strength.

The preceding figures do not refer to rivet and pin steel, the former having to be soft and ductile, particularly for rivets put in during erection, and ranging between 50,000 pounds and 58,000 pounds ultimate tensile strength per square inch; while the pin steel must be quite hard, with a tensile strength between 75,000 pounds and 85,000 pounds per square inch.

The decision arrived at by the American Society for Testing Materials has been that a one-grade steel having an ultimate strength of from 55,000 pounds to 65,000 pounds per square inch, is, on the whole, very desirable; and that this decision will no doubt bear fruit, to the advantage both of the manufacturer and the consumer. It has been clearly demonstrated that such steel is quite reliable, and may be used with advantage for all structural purposes; for it can stand more abuse than the best double-rolled wrought iron, and can be punched and sheared with no greater injury than such treatment would inflict on the latter metal, if the thickness does not exceed ⅝ in. We feel sure that American engineers are wise in having come to so important a decision.

The Bath Iron Works and the Hyde Windlass Works, the property of the United States Shipbuilding Co., were sold at Bath, Me., Sept. 19, by order of a decree entered in the United States district court for New Jersey, June 30 last. The property was secured for the reorganization committee represented by Francis D. Pollock, whose bids were the only ones made. The plants were sold separately. For the Hyde Windlass Works, Mr. Pollock's bids were $425,000 for the real property and $100,000 for the personal property. For the Bath Iron Works the bids were, for the real property $300,000 and for the personal property, $40,000. The sale was conducted by Receiver James Smith Jr. Charles M. Schwab was present.

G. A. Tomlinson, of Duluth, on Sept. 19 closed a contract with the Great Lakes Engineering Works, of Detroit, for a steamer which will be the second largest on the lakes. The contract calls for delivery of the boat next April. The steamer is to cost $330,000 and will have a carrying capacity of 8,000 gross tons. Although the new boat will rank next to the Wolvin in size, she will be 50 ft. shorter than that record-making steamer.

The contract for the new structural mill, to be erected by the Republic Iron & Steel Co. at the Brown-Bonnell plant at Youngstown, has, it is reported, been let to the Lloyd-Booth department of the United Engineering & Foundry Co.

The Labor Situation.

MOLDERS' STRIKE AT CINCINNATI.

CINCINNATI, Sept. 20.—The situation in the molders' strike in this city is without change of importance in the past week. The National Foundrymen's Association has opened an office in the Union Trust building and men are coming in from other cities to take places in the shops. There are now about fifty men available to be placed as soon as it can be decided as to how best to distribute them. As yet no real effort has been made to start the foundries, and until good working forces can be secured, the foundry men will not make such an effort. There has been but little violence so far reported in this city, but in Newport last evening five men who had taken the places of striking molders in the Newport Iron & Brass Foundry Co.'s works were assaulted and badly hurt. All of the shops in the city are closely picketed. The foundrymen have declared that they will carry this contest to a conclusion and will not enter into any more agreements with the unions. It is to be a fight for the open shop in all of the foundries involved. The Cincinnati office of the Foundrymen's Association is in charge of Major McKinley and T. P. Gould. Secretary Chas. F. Waltz, of the Cincinnati Employers' Association, is to look after the legal end of strike, such as injunctions and arrests.

AMALGAMATED MEMBERS ENJOINED.

The temporary injunction applied for by the Carnegie Steel Co. before Judge E. E. Roberts at Warren, O., to restrain its former employes from interfering with the operation of its mill at Girard, O., was granted on Monday, Sept. 19. The men enjoined are all members of the Harmony lodge of the Amalgamated Association of Iron & Steel Workers, and declared a strike at this plant on August 20. At the same time strikes were declared on at the upper and lower plants of the Carnegie Steel Co., Youngstown, which are still in progress.

The decision of the court is one of the strongest yet delivered in a case of this kind, the court's definition of "freedom" in this jurisdiction being as follows: "Freedom means the right of every individual and every corporation to sell his labor or conduct its business in a lawful manner, free from dictation of any one; and that every one has a right to work, and every one has a right to employ his services, free and untrammeled by coercion or any form of wrongful pressure."

COMPLETE VICTORY FOR EMPLOYERS.

The machinists' strike in Chicago, which has been waged all summer is, to all intents and purposes, over, the victory being a complete one for the National Metal Trades Association and the local Chicago organizations, which two bodies have worked in conjunction since the trouble commenced. All the shops of the members of the two associations are running to full capacity, and under the new regime are turning out a greater amount of work than before. Union strikers are still picketing a number of plants, but are meeting with no success in inducing any of the men who have taken their places to quit work. The associations have discontinued bringing men to this city, having for some weeks been able to get all the help wanted in Chicago, many of the applicants coming from the ranks of the strikers. The machinists' strike this year is a complete victory for the employers.

METAL TRADES ASSOCIATION NOTES.

Commissioner Eagan is spending the week in Chicago with a view of increasing the membership and looking after the business incident to the late labor difficulty in that city.

The September issue of the *Bulletin* containing the photograph of President Covell is meeting with much favorable comment.

The National Foundrymen's Association has opened an office in the Union Trust Building in Cincinnati as temporary quarters to carry on the work of the association in assisting its twelve members involved in the molders' strike in that city.

J. W. Lee, manager of the employment department of the St. Louis Metal Trades Association, reports that the situation of the iron molders' strike in his city is very satisfactory, it being impossible to employ all applicants for work in the struck foundries.

A conference has been held between the New York Metal Trades Association and the blacksmiths' union, each being represented by committees on the subject of a new contract. The conference was held on Sept. 19.

At a well-attended meeting of the New York Metal Trades Association, Sept. 15, it was unanimously decided to establish a labor bureau.

The strike of the boiler makers in the shop of W. & A. Fletcher Co. is still on.

The Manufacturers' Association of Pittsburg is receiving applications for work in excess of calls for help. The local secretary reports the situation in Pittsburg as quiet, and that there have been no labor troubles of any kind reported for over a month.

Reports from the Worcester Labor Bureau indicate a revival of business.

The committee having in charge the arrangements for the next quarterly dinner of the Cincinnati Metal Trades Association are making elaborate plans for the entertainment of their fellow members and guests. The dinner will take place Oct. 6.

President Covell anticipates calling the next meeting of the administrative council about Oct. 24 at Cincinnati.

W. D. Sayle, chairman of the plan and scope committee, is figuring on Oct. 10 as the proper time to hold his meeting to formulate recommendations to the administrative council.

The labor situation in Harrison, N. J., is in excellent condition, there being no trouble of any kind with either machinists or molders.

Reports received indicate that the Rock Island arsenal machinists are very strongly organized.

Information from Honesdale, Pa., indicates that the strike of the machinists in the shops of the National Elevator & Machine Co. was caused by the business agent, who, it appears, was anxious to show his superiority over the N. M. T. A. and thought Honesdale a good place to do it on account of its isolation. Now the strikers are anxious to go back to work, but are afraid of being blacklisted. Their positions, however, have been filled. No disorder is being experienced and the firm is running along again as usual.

The Springfield Boiler Mfg. Co., of Springfield, Ill., reports that it has absolutely had no trouble since the strike a year ago which lasted eighteen weeks and resulted in an "open shop.'

Indications are that there will be a very substantial increase in the membership of the association this year, due no doubt to the splendid showing made by the association in the recent labor difficulty which took place in Chicago.

LABOR NOTES.

The local organization of the International Association of Bridge & Structural Iron Workers for Pittsburg and vicinity has presented a new scale to the manufacturers, for signature Jan. 1, and which will not expire until May 1, 1906. It provides for the eight-hour day, time and a half for overtime, and double time for Sundays and holidays; for a minimum scale of $4 per day; for the employment of union men exclusively; for arbitration; and it is also provided that sympathetic strikes shall not be considered a violation of the agreement.

The Manufacturers' Association of Pittsburg has sent a request to the boiler makers' helpers for a conference to revise the existing scale of wages. The present scale provides for the payment of $3.15 per day, being valid for five years, unless either side desires a change which is to be effective four months after the request has been made.

The trouble between the boiler makers' union and the Utica Steam Engine & Boiler Works, Utica, N. Y., has been settled on terms satisfactory to both the company and the union.

The Krein Chain Works, St. Mary's, O., has been closed indefinitely because the 200 employes refused to accept a reduction of 12½ percent. Excessive cost of oil, which is used as fuel, is given as a reason for the wage reduction.

A movement has been started to organize a union of mates on the Great Lakes. The mates were formerly members of the

Masters' and Pilots' Association, now defunct, and the vessel owners objected to masters and pilots belonging to the same organization.

The strike which has been in progress at the plant of Flather & Co., Nashua, N. H., was declared off Sept. 13. The company has made no agreement or had anything to do with the union, but the men have been coming back one by one since May 28.

The Microscope in the Study of Steel.

In a discussion on a paper "Variations in Structures and Tests of Steel" before the West of Scotland Iron and Steel Institute, some mention was made of the limitations of microscopic analysis. W. Cuthill remarked that the micrograph tells nothing of the composition of steel, whether high or low in impurities, but this we learn from the chemist. It tells as little of the mechanical properties of steel, whether high or low in strength and ductility, but the testing machine provides the information. It has, therefore, a distinct province of its own, and that is to reveal the work and heat treatment steel has undergone, which neither the chemist nor testing machine can indicate with any reliability. In this respect it should very usefully fill a gap in the investigation of many puzzling and difficult problems in the behavior of finished steel. For instance, has it been burned, or has it been finished in the rolling at too high a temperature? A. Campion said he thought that in some cases it was possible to gain an idea as to the amount of certain impurities which were present by microscopic analysis; for instance, steel containing much arsenic or phosphorus. Steel containing a high percentage of manganese also showed a structure quite distinct from that of steel containing a small amount of manganese. Regarding the possibility of distinguishing between steel which had been overheated, and that which had been burnt, he thought a steel that had actually been burnt was one of the easiest things to detect under the microscope. F. W. Harbord wrote that microscopic analysis, like many other things, has suffered from the somewhat extravagant claims made by some of its early exponents, and the authors of the paper had done a very useful piece of work in defining the limitations of microscopic analysis, by showing that although the details of the structure may vary in various parts of a bar, the general structure remains the same. Provided that the heat treatment has been the same, the educated eye has no difficulty in discriminating between the general as distinct from the detail structure, and although the size of the grain may vary from the outside to the center, or other parts of a large bar, the micro-constituents are clearly defined. In certain cases of marked segregation, when the metal is high in sulphur or manganese, the former may be clearly seen as buff colored round or elongated spots, the latter by the alteration in the structure of the material. The real value, however, of microscopic work is that we are able to determine the marked influence of heat treatment, and although similar steels heated or cooled under identical conditions will often vary considerably in their detailed structure, the general type of structure of annealed or rapidly cooled, or quenched steels is so characteristic that it can be at once identified by the practiced observer. He was glad to see that the importance of using the microscope as an adjunct to other methods of testing, and not as an independent method of investigation, had been emphasized by the authors, as it could not be too strongly insisted upon, that it does not replace, but only supplements other methods of examination.

Benj. Middleditch, brass founder and finisher, of Detroit, has moved from Iron street to 97-103 Meldrum avenue to his new two-story and basement brick building. This structure is 50 x 100 ft. He has added new machinery giving a considerable increase in capacity. The firm manufactures machinery, flasks and supplies, and reports that although business has been quiet for the past few months, present inquiries and orders indicate better business for immediate future.

The American Car & Foundry Co. has begun operations at its plant at Birmingham, Ala. About 450 men are employed. The plant has an order for 350 cars from the New Orleans & Northeastern to begin with, and on Oct. 1 a contract with the Gulf & Ship Island for 250 cars will be in hand.

STEAM TURBINE CONDENSING OUTFITS.

At the present time much interest centers in the steam turbine, which promises to reduce the weight and cost of prime movers. Two large machines of this type are on exhibition in blocks 51 and 44, Machinery building, at the St. Louis Fair, one being shown by the Westinghouse Machine Co. and the other by the General Electric Co. Economic utilization of the energy of steam requires its expansion to the lowest possible pressure, which in the turbine is accomplished without the usual losses due to the corresponding extremely low temperatures. In actual service it is claimed the economy of the turbine is increased by approximately 3 to 5 percent for each inch of vacuum higher than 26 inches. It is therefore of vital importance that all losses should be reduced to a minimum. The absence of oil from the steam renders the use of a surface condenser desirable in places where the saving of condensed steam is important. The fact that the finual temperature of the condensing water must be comparatively low necessitates the highest degree of efficiency in its use and the immediate and complete removal of all noncondensible vapors, whose presence would increase the absolute pressure and consequently reduce the efficiency of the turbine.

The steam from the Westinghouse-Parsons turbines at block 51 is condensed in a 1,500-sq. ft. surface condenser, supplied by Henry R. Worthington. The air is removed by a Worthington rotative dry vacuum pump of the center crank type, but similar in other respects to the horizontal pumps already described. An air cooler is interposed between the condenser and the vacuum pump, considerably increasing the capacity and efficiency of the latter. The condensed steam is removed from the condenser by a Worthington volute pump directly connected to an induction motor. The operation of this pump is very interesting, since it requires neither valves nor floats and is not subject to vapor binding, as are reciprocating pumps. The pump is placed below the level of the condenser, receiving the water by gravity, and its capacity is such that it runs ahead of the supply, so that the suction pipe is never full. The discharge pipe is, however, always full and pressing back against the pump, but so long as the latter is in motion there is no possibility of the water passing back to the condenser, so no automatic devices are needed. In another turbine plant a pump of this character returns the hot water directly from the surface condenser to the boiler against a pressure of 250 pounds.

The Curtis steam turbine, exhibited by the General Electric Co. in block 44, is of the vertical type, and the conednser is placed in the base of the steam turbine. It contains 8,000 sq. ft. of tube surface and was built by Henry R. Worthington. The air is removed by a rotative dry vacuum pump, similar as regards the air end, to those heretofore described, but driven through the medium of a silent chain by an electric motor.

John H. Hall & Co., 248 Fourth avenue, South Minneapolis, Minn., jobbing patternmakers, are distributing desk blotters, on the back of which is shown a halftone reproduction of a pattern for a 46-in. Corliss engine cylinder made in their shop for the Minneapolis Steel & Machinery Co., of the same city. This company has the largest jobbing pattern shop in the Twin Cities and takes orders for work from all parts of the United States.

A reader of *The Iron Trade Review* is anxious to buy second-hand drop forging equipment, including trimming presses, drop hammer, helve hammer, die-sinking machine, heating furnaces, etc. Communication with parties will be made by writing to "Inquiries," care *Iron Trade Review*, 1164 Monadnock Bldg., Chicago.

The Cast Thread Fitting & Foundry Co., Seneca Falls, N. Y., recently incorporated with a capital of $250,000, has acquired the business and plant of the Gleason, Bailey & Sciple Mfg. Co., and will continue the manufacture of cast iron threaded and flanged fittings for steam, gas and water.

It is not expected that the plant of the National Tube Co., at Cohoes, N. Y., recently closed, will be operated at any time in the near future.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Wednesday, Sept. 14. B. M. Shaw, president, presided. The routine business was dispensed with in the usual manner.

The report from the committee on resolutions upon the death of A. J. Miller was received and adopted.

The president then introduced Mr. F. R. Fletcher, of the Library Bureau, Boston, who addressed the meeting on the subject "Foundry and Factory System." After a short intermission, dinner was announced, after which the president introduced Mr. Kenneth Falconer, of Montreal, Canada, who gave a very interesting address along the lines of the accounting system in the foundry.

A rising vote of thanks was extended to both speakers. The meeting adjourned at 9 P. M. with the following in attendance:

Kenneth Falconer, Montreal, Can.
B. M. Shaw, Walker-Pratt Mfg. Co.
F. R. Fletcher, Library Bureau.
Geo. B. Buckingham, Arcade Mall. Iron Works.
Geo. C. Belcher, Belcher Malleable Iron Co.
Morris L. Gay, Rogers, Brown & Co.
A. E. McClintock, National Founders Ass'n.
Geo. H. Stevens, Walker-Pratt Mfg. Co.
Herbert L. Paine, Walker-Pratt Mfg. Co.
H. E. Gibby, Mechanics Iron Foundry Co.
Geo. H. Lincoln, G. H. Lincoln & Co.
J. P. Barstow, Barstow Stove Co.
H. S. Hastings, Worcester Metal Trades Ass'n.
John Nelson, The *Iron Age*.
G. H. Carson, Mechanics Iron Foundry.
W. B. Snow, B. F. Sturtevant Co.
T. C. Wilson, Barbour-Stockwell Co.
J. O. Henshaw, N. S. Bartlett & Co.
L. N. Perrault, B. F. Sturtevant Co.
Asa Smith, B. F. Sturtevant Co.
J. W. Busch, Pratt & Cady Co., Hartford, Conn.
W. M. Saunders, Saunders & Franklin.
W. H. Coffin, Springfield Facing Co.
E. J. Lyon, Brown & Sharpe Mfg. Co.
W. G. Moody, Rogers, Brown & Co.
D. L. Moody, Rogers, Brown & Co.
C. Hitch Jr., American Tool & Machine Co.
F. G. Scholfield, Kabley Foundry Co.
H. J. Burrough, Builders Iron Foundry.
E. V. Hazard, Old Colony Foundry.
C. L. Nutter, Old Colony Foundry.
Wm. J. Breen, Agt., Hugh W. Adams.
Walter S. Wood, Cutter, Wood & Stevens Co.
Wm. T. Nicholson, Cutter, Wood & Stevens Co.
C. J. Wetsel, Baush Machine Tool Co.

CALENDAR FOR THE YEAR.

The following calendar was announced for 1904-1905: Sept. 14, afternoon, Mr. F. R. Fletcher, Library Bureau, subject: "Foundry and Factory System;" evening, Mr. Kenneth Falconer, of Montreal, P. Q., Can. Oct. 12, afternoon, Mr. C. H. Thomas, Newark, N. J., president of Foundry Foremen's Association, subject: "The Casting of Iron;" evening, Mr. Thomas D. West, Sharpesville, Pa. Nov. 9, afternoon, Mr. H. E. Field, Pittsburg, Pa., subject: "The Chemistry of Iron;" evening, Dr. Richard Moldenke, Watchung, N. J. Dec. 14, Mr. George H. Hull, president American Pig Iron Storage Warrant Co., subject: "The Finance of Iron;" evening Mr. Archer Brown, Rogers, Brown & Co., New York. Jan. 11, annual meeting with special features, to be announced later. Feb. 8, afternoon, Mr. Albert Saveur, Boston Testing Laboratories, subject: "Physics of Iron"; evening, Mr. Henry Souther, of Hartford, Conn. Mar. 8, afternoon, subject: "How to Obtain Skilled Labor," speaker to be announced later; evening, Mr. O. P. Briggs, Committee National Foundrymen's Association. April 12, afternoon, subject: "Insurance," a representative from the American Mutual Liability Insurance Co.; evening, Mr. James Gould, of Jesse Gould & Son, Boston. May 10, subject: "Foundry Supplies and Equipment," speakers to be announced later. June 14, afternoon, subject: "Molding Machines," speaker to be announced later; evening, Mr. E. H. Mumford, Tabor Mfg. Co., Philadelphia.

Foundry and Factory System.

Mr. Fletcher's paper was as follows:

Twenty years ago the word "system" applied to manufacturing and business establishments was involved in the average mind with the words "red tape." There is still a lurking suspicion in many quarters that the two are analagous, and close examination of many so-called systems does lend a color to this assertion. Several years a prominent manufacturer when asked what system he employed in establishing information regarding the costs of his production, replied that he had no special system, but felt that as long as they could put up a new building each year the costs must be all right. The yearly profit and loss column is *convincing* if not particularly enlightening. A factory turning out several lines of product may show a profit on the entire output, although a careful analysis proves that certain articles are sold below cost. This analysis of cost is pretty sure to find certain parts which can be purchased cheaper than the plant can make them. It will be generally admitted then that even red tape if employed judiciously and as a system is not to be scorned.

In these days of specialization there is perhaps no more interesting work than that of the production engineer, or expert systematizer. This specialist has a fund of knowledge acquired by experience in dealing with the vexing problems of various clients. His knowledge is more general and broader than that of the manufacturer and his insight, not blinded by previous custom, detects quickly the weaknesses and unnecessary labor which have accumulated unnoticed for years. He may have no practical knowledge of machines and still in a short time prove to the manufacturer that his method of production is wrong. It is his business to install a system which will provide first of all, facts; then by accumulation and analysis, information regarding every detail of expenditure and production.

Mr. Magee, in asking me to speak to you on the subject of Foundry and Factory System, inferred that the opportunity for advertising the Library Bureau should be a sufficient inducement. I think he expected me to tell you that the card system produces the only successful method for factory and cost accounting, and that its adoption guarantees an immediate cure for all the ills attending factory management. I wish you would prompt me should I fail in so doing.

In recent conversation with a gentleman, for whom I had outlined a system requiring some rather extensive changes in office arrangements, the question arose as to where the cabinets should be placed. I suggested removing a section of a long and but partially useful counter. "Why!" said he, "that counter has been there for over thirty years." Then after a pause of a few seconds, he laughed and acknowledged that undoubtedly a great many of their methods were maintained for a similar reason. One cause for success obtained by certain new plants, in direct competition with older and better known houses, lies in the fact that they are not handicapped by a fondness for the old-time methods, installed under entirely different conditions and added to rather than remodeled to meet the more exact demands of the present. The manager of the long established business, realizing that changes are necessary in his methods of records, feels that such changes must be made personally and puts off the issue for a moment of leisure which never appears. Recently in going over a well known plant I found a method of handling customers' orders which though not economical is still in vogue in many factories. An order for a machine was entered in an order book, full statement being copied from the customer's letter. The same facts were then copied into a drafting room order book. This book was sent to the drafting room after the day's orders were entered. The head draftsman ran over the specifications and if clear signed the order. The order book then passed to a draftsman for a schedule of parts and factory specifications. In order that each department of the factory might be informed of work in hand, this same order was then rewritten into separate department order books and the details into separate department detail books. When ready for shipment the order was again re-written in the shipper's record book. In other words each machine order was actually rewritten seven times and the machine details four times. Not only an extravagant waste of time, but a serious source of error. In place of these order books consider what a loose order or card order would achieve.

I have here a pad of orders used in our own selling office. Seven copies are made of each order at one writing by manifold process. These orders are typewritten and thoroughly readable. One copy is an exact reproduction of another. In place of that original order book, use this loose order, making

as many carbon copies as are necessary to satisfy the demand. The original remains in the office filed in a tray alphabetically by name of customer, the other copies going to the head draftsman. A detail and specification sheet in manifold similar to the loose order replaces the detail book. In making out the detail sheet which is to accompany an order, the draftsman makes one copy for each copy of the order and fastens them to and distributes them with the separate copies of the order. In this way the superintendent, the foreman, the shipper, and the order clerk each have exact reproductions of an original order, each copy of which is to serve a definite purpose in the plant and return eventually on completion of the order to the office. This loose order system has saved this plant two clerks, formerly employed in copying orders, and serves as a practical basis for a complete system of factory accounting.

In a well organized plant no labor or material is expended without a numbered order. The storeroom is in charge of the storekeeper, and supplies, tools or material are obtainable only on signed requisitions from foremen. The store's account in the ledger charged with all goods purchased or manufactured for stock and credited with goods used in assembling and manufacturing orders, must therefore check almost absolutely with the balances shown on the record maintained by the stock keeper. There is no opportunity for leak or waste, no overstock of slow moving material and no delay in filling orders for stock parts. The card stock record with one card for each article arranged by part number or alphabetically by articles provides a practically permanent inventory of the stock room. Each card shows receipts, disbursements and balances and clearly indicates the maximum and minimum limits of that article. The stock keeper must issue orders for replenishment whenever the balance nears the minimum point. His orders are in two forms; requisitions on the purchasing department for material to be purchased; production orders on the factory for manufactured goods. Purchase requisitions are made with carbon duplicate, the original going to the purchasing agent, the duplicate being filed by stock keeper as "orders awaiting receipt." The production order is a triplicate manifold blank. The original and duplicate go to the superintendent, the triplicate he retains and files back of the stock card to which it relates or alphabetically by name of article in an "unfilled order" tray. The superintendent approves and signs the original and duplicate order or notifies the stock keeper in case order is not passed. The order accepted, the original copy passes to the department which starts the work via the drafting room if drawings or details are required, the duplicate copy going into a file by part number or name of article on the superintendent's desk. For each production order put in work, a cost card is made, the function of which is to obtain the items of cost as they accumulate. A plant order similar in form and operation to the production order is issued by the superintendent for repairs, additions or betterments required by foremen or departments. These orders are issued only for work valuing $20 or more in cost.

In place of monthly blanket orders to which all sweeping, cleaning and other indirect labor is charged, a series of standing order numbers is assigned. This table of numbers embraces the time of foremen, engineer, firemen, helpers, lumpers and every operation or expense which cannot be directly charged to a production or plant order. A chart of these numbers is placed in every department so that each employe can definitely account for his time.

Material cards are used by foremen in obtaining material from stock. The stock keeper accepts this signed order in exchange for material called for and will disburse stock in no other manner. These material cards are sorted by article and a total entry is made by the stock keeper on his stock record cards of the withdrawals for the day. He then signs the material cards and passes them on to the office where they are sorted by order numbers and placed in a drawer of the cabinet assigned to cost records.

Time cards are used by employes in reporting their work for the day. Each operator uses a separate card for each order number on which he works. He writes on the card the order number, his own number or name, the operation if not included in the printed list on the card and checks the time used in the operation. These cards are gathered once or twice a day and must be approved by the foreman and signed before they are sent to the office. In the office, each morning the time cards of the previous day are sorted by employes' number and the total hours shown by the employes' cards are checked with the time clock record. If they do not agree cards are returned at once to the foreman for correction. On piece work the method involves the same procedure, except that at this point the posting of piece-work labor is made direct to the pay roll where day work labor is posted to the pay roll from the clock cards. The pay roll entries having been made, the time cards are re-sorted by order number and placed in the drawer with the material cards already referred to. When an order is completed, the total material and total hours of labor expended as shown by these time and material cards is brought forward to the cost card and a recapitulation of costs by departments is made. Time and material cards are then filed for two or three months by order number for reference but are eventually destroyed. This recapitulation is made at least twice a month on all orders completed and in process and the costs of labor and material, together with the assessment of indirect expense, is brought forward to an analysis sheet or manufacturing journal. The total value of material expended for the month as shown by this sheet should check with the value of disbursements shown by the stock record and the total cost of direct labor should check with the pay roll account. The total indirect expense charged these orders should check with the monthly expense account. On completion of an order the cost card bearing the final entries is placed in a cabinet arranged by name of article, or part number. In this order, as records accumulate, there is constant opportunity for comparison of cards on similar orders. In addition to the proportion of fixed expenses which each production order must bear, cards or slips are provided similar in style and function to the material cards. No tools or supplies can be obtained without a signed order. These slips pass to the office from the store room and are entered on department analysis sheet. This sheet accumulates by departments the proportion of fixed expenses, superintendence, etc., in addition to the charges for supplies, and the monthly total is the amount which must be distributed and included in the cost of production orders for the succeeding month.

I have attempted to outline roughly a method of accumulating the items of costs of production in a well organized factory. Possibly I should have dwelt more deliberately on this word "organized" for on the organization depends first, the accuracy of the records; second, their practicability, significance and value. In the well organized factory each department is distinct yet subservient to a general plan by means of which each operation or duty is performed with a knowledge of its relation to others and its effect thereon. Responsibility is fixed and clearly understood. Under these conditions facts are valuable and every scrap of information regarding direct or indirect expense is collated and recorded to produce a result. The result places in the hands of the manager a thorough knowledge of each department of the plant, its abilities and weaknesses, and sets aside the theoretical knowledge which is too often the cause of failure. I have indicated the natural adaptability of the card system to economical accumulation of records, and the enormous growth and development of the card index business will bear me out in the statement that no other method has proven so satisfactory or so capable of unlimited use. This growth of the card proposition and the increasing sales of cards, cabinets and vertical filing outfits does not mean, however, that the concern which has purchased cards and cases most extensively must therefore have the most complete or economical system in records. A system, good or bad, is the result of thought and experience. The card system then is useful only as applied practically to individual requirements. Even as a failure though, a card system is better than books, for it brings the results more accurately, with less work and at smaller expense.

In factory work the card system is apt to begin its efficiency as an index to drawings, patterns or parts. It is frequently adopted in the stock room as a stock record or ledger or perhaps in the office as a record of employes or list of customers. Such uses are more general than a definite development in which each department and record is considered as

part of, and in relation to, the business system as a whole. I do not wish to be understood as objecting to the use of the card index for such individual purposes, for a practical knowledge of the advantages of card system is most easily obtained in this manner, but merely to emphasize the much greater and more important results obtainable from a system in which each record is considered in its relation to others and as a part of the complete organization.

A NEW AIR HOSE COUPLING.

A new air hose coupling is a very simple affair designed to meet the demand for a strong and quick-acting device for use with pneumatic tools. Fig. 1 shows the coupling assembled and Fig. 2 the parts disconnected. No wrench or spanner is

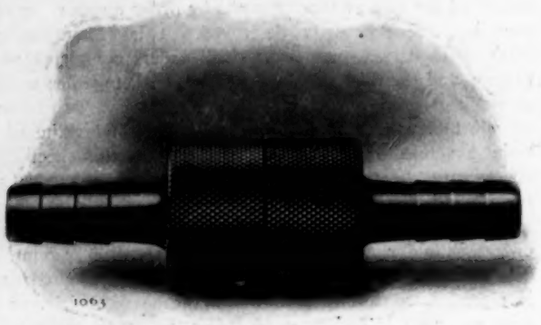


FIG. 1.—A NEW AIR HOSE COUPLING.

required to either couple or uncouple the parts. To couple, the operator pushes the halves together by hand and slightly twists the locking rings in opposite directions. To uncouple, the operation is reversed. Both halves of the coupling being identically the same, the usual necessity of mating the ends is obviated.

There are no projections to catch as the hose is being dragged from place to place. The rubber sleeve is entirely encased when the coupling is made, and will withstand any working pressure without leakage. The parts are made of brass, extra heavy to stand rough usage and are machined throughout. This coupling is not to be compared with the cheap and light cast couplings on the market. It is manufactured in all standard sizes for connection—hose to hose—hose to pipe—or pipe to pipe, with male or female shanks, by the pneumatic tool department of the Ingersoll-Sergeant Drill Co., of New York.

Frazer & Jones Co. Reorganized.

A reorganization of the Frazer & Jones Co., of Syracuse, N. Y., was completed last week. George S. Hier, one of the principal stockholders, has sold his interest to Hendrick S. Holden, Fred Frazer, C. R. Jones, of Syracuse, and O. P. Letchworth, of Buffalo. The following officers have been elected: R. W. Jones, president; Fred Frazer, vice president; Charles R. Jones, treasurer, and O. P. Letchworth, secretary. These members, with H. S. Holden, constitute the board of trustees. Mr. Letchworth, who now becomes an officer of the company, is well known in iron trade circles and has large interests in Buffalo. He is president of the Pratt & Letchworth Co., manufacturer of malleable iron and steel castings. He is also president of the U. S. Hame Co., of which several of the officers of the Frazer & Jones Co. are stockholders and directors. The Frazer & Jones Co. manufactures saddlery hardware, and W. F. Pardee, a traveling representative of the firm for twenty years, has been appointed general sales agent with headquarters at Syracuse.

A correspondent of the *Engineer* answers a request for some good recipes for bronzing iron and steel with the following: "I would say the following is a good one, viz., oxalic acid 2 oz., turpentine 2 oz., benzine 4 oz., and liquid ammonia 2 oz. Mix these well, and after the oxalic acid is thoroughly dissolved add 4 oz. of finely pulverized chalk. Thoroughly shake before using. The mixture must be bottled. Apply with a sponge, and allow to dry. Then polish with dry waste or cloth. Iron or steel, when nicely bronzed, looks very well in an engine room. The process is as follows: Mix chloride of antimony with olive oil until it is of a thin creamy consistency. The iron or steel must be well cleaned and rendered bright; scrub it with whiting and water, to take any oil or grease from it. Have the iron or steel pretty warm, then paint the surface with the antimonious cream. Leave it covered until the desired shade is produced, or about gunmetal color. Clean the surface with hot water containing a little soda. The surface can then be polished."

New Haven Iron & Steel Co.

The report of the New Haven Iron & Steel Co. for the year ended Aug. 30 shows: Gross sales, $369,112; net profits, $3,222; accounts charged off, $1,539; net credit to surplus account, $1,682. The gross sales compare with $587,949 in 1903. The net profits in 1903 were $32,942. The directors adjourned without declaring the September dividend. After the meeting, Secretary Crossnan said:

"The action of the management in deferring the September dividend does not mean that the company's future is endangered. The management has never been committed to any fixed dividend policy. It has always made such disbursements to stockholders as were warranted by earnings, and if conditions at the end of the next six months are such as to recommend a dividend it will be paid.

"As every one knew, the business of the company for the fiscal year ended Aug. 31 was far from expectations, but at that we did not do any worse than other companies of the kind. Our stockholders have been informed all along as to the business being done, and there has been no dissatisfaction expressed at the postponement of the dividend."

The last dividend of the company was paid in March, and was at the rate of 15 cents a share.

The Damascus Nickel Steel Co., Pittsburg, now has a new and efficient management at its plant in Carnegie, near Pittsburg, which has been greatly improved lately by the installation of new boilers, one 10-in. rolling mill complete, one 16-in. rolling mill complete, one electric power plant, one open-hearth steel furnace, 10 tons' capacity. The company now has one of the most up to date plants in the United States and is in excellent shape to execute orders very promptly for high speed tool steel, Damascus special tool steel, Damascus extra tool steel, nickel steel for cutlery and other purposes, crucible and open-hearth spring steel, crucible and open-hearth machinery steel, forgings smooth forged for die blocks, shafts, spindles, cutting dies, etc.

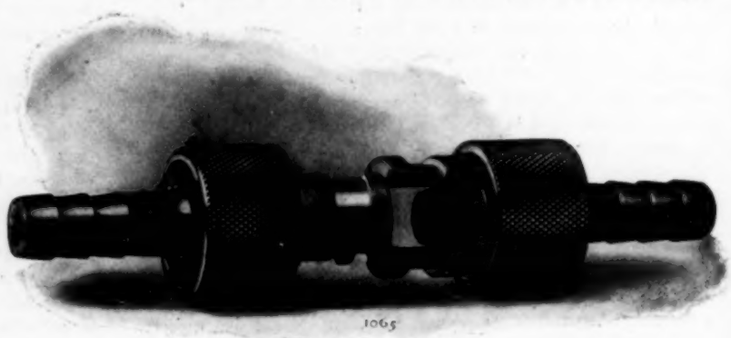


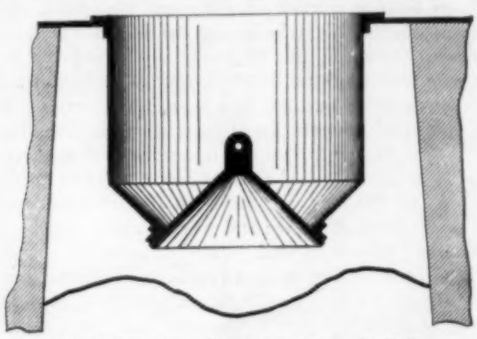
FIG. 2.—AIR HOSE COUPLING READY FOR CONNECTING.

The Portland Steel Shipbuilding Co., St. Johns, Ore., is putting in the most modern machinery and appliances and will build vessels up to 350 and 400 ft. long. The company will make sailing ships a specialty, using steel to a large extent. It is expected that the plant will be ready for operation in about two months.

Special Forms of Blast Furnace Charging Apparatus.*

BY T. F. WITHERBEE, DURANGO, MEXICO.

That the single charging bell, properly proportioned, is a good all-around device for distributing the material in a blast furnace can scarcely be questioned; yet it is equally true that, in some cases, it has not given perfect satisfaction. This

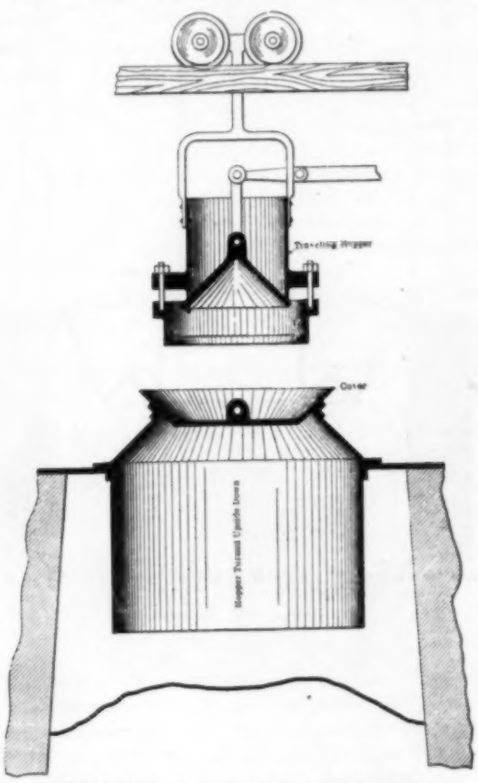


Distributing charge in a ring next to the lining.

FIG. 1.—SINGLE BELL AND HOPPER AT A CHARCOAL IRON FURNACE.

has been demonstrated by the use of double bells, at furnaces under the best management—generally in cases where anthracite, either alone, or with a portion of coke, was used as fuel. The defect of the single bell seems to be that it does not permit, beyond very narrow limits, such changes in charging as may be required by the temporary condition of the furnace.

Modern furnaces using Connellsville or other good coke and Lake Superior ores seem to be well served with a single bell. At least, up to a certain size, somewhere about 18 by 85 ft. to



Distributing charge in a heap at the center.

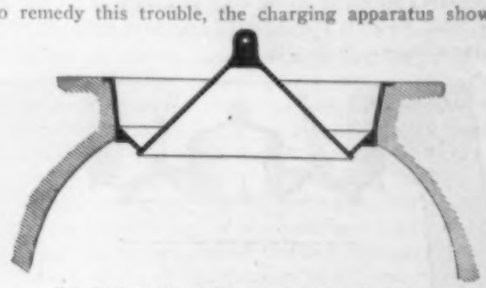
FIG. 2.—LATER FORM OF SINGLE BELL AND HOPPER AT A CHARCOAL IRON FURNACE.

19 by 90 ft., they make low silicon pig iron with about 1,800 lb. of fuel, or in some cases very much less.

The following instances occur to me, in which other forms of charging apparatus have been employed with advantage:

1. A charcoal furnace, 61 ft. high, 11 ft. in diameter at bosh, and 8 ft. 2 in. at stock line, with a rectangular crucible, 42 by 36 in. in size, and bell and hopper as shown in Fig. 1, yielded at the start black scouring cinder and white iron, and so continued for 30 days, when it was shoveled out. The gas circulation had been wholly through the center; and for 30 ft. above the tuyeres no fire or heat had reached the walls, the red color of the fireclay still showing in the firebrick joints. It is probable that the small crucible, only 36 in. wide, had something to do with the center circulation. This feature was unavoidable, since the old stone stack would not permit a larger hearth.

To remedy this trouble, the charging apparatus shown in



Distributing charge in a ring next to the lining.

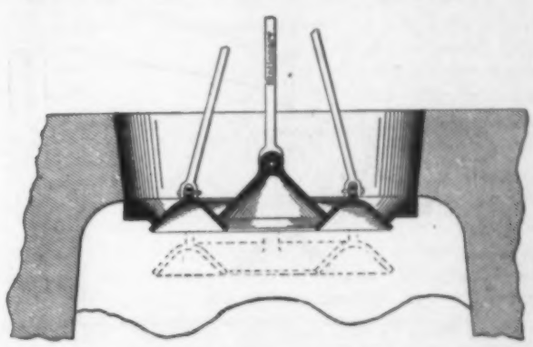
FIG. 3.—SINGLE BELL AND HOPPER AT AN ANTHRACITE IRON FURNACE.

Fig. 2 was designed. This deposited all the ore and stone in a heap about 3 ft. in diameter in the middle of the furnace. The result was favorable, except that at intervals of about eight or ten days scouring cinder and no iron would be made for two or three (in one instance for six) hours, after which regular work would begin again: That trouble was cured by increasing each fuel charge from 20 bushels of charcoal to 100 of charcoal and 25 of wood.

The fuel consumption averaged for considerable periods less than 1,600 lb., and even for long campaigns 2,000 lb. of fuel per ton of 2,300 lb. of iron, considering that such work was done with Champlain magnetites and iron pipe stoves, more than thirty years ago, according to the practice and knowledge of that period, we must admit that the results were at least fairly good, and proved such a system of charging to be not incompatible with fuel economy.

This apparatus was only a makeshift; but so satisfactory was its working that it was used for about five years (until the charcoal supply became exhausted), during which time the furnace worked smoothly without a single slip.

2. A second instance of unsatisfactory working with a single bell was at an anthracite furnace 71 ft. high, 16 ft. in diameter at bosh, 14.5 ft. at stock line, and 8 ft. in the crucible, with six 4-in. tuyeres, and a 7.5 ft. bell as shown in Fig. 3. Notwithstanding the relatively large stock line diameter, the bell banked the ore snugly against the furnace lining.



Distributing charge both in a ring next to the lining and in a heap at the center.

FIG. 4.—THE BAUMAN BELL AND HOPPER.

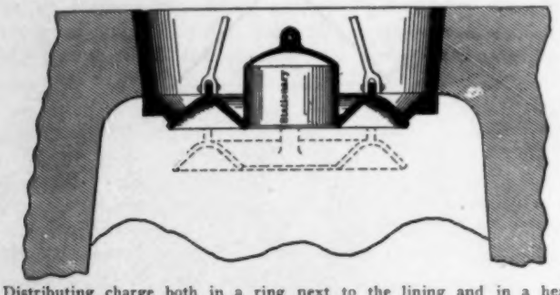
A good blow in was effected, but at the end of three months the furnace got into a scrape and the campaign was finally (though, as subsequent experience demonstrated, unnecessarily) abandoned. Examination showed a hole 55 ft. deep, burned through the center, leaving about 4 ft. of loose stock on the walls. The furnace could have been saved by filling the hole with anthracite, and applying an extra volume of blast.

Subsequent campaigns, so long as anthracite only was used,

*Read at the Lake Superior meeting of the American Institute of Mining Engineers, September, 1904.

showed a tendency to center circulation, although the stock line diameter was reduced to 12 ft. Indeed, why should this not be the case, especially when dense, heavy, fine magnetite is charged? The natural effect of a single bell, at least under the conditions above stated, is to render the outside ring of materials more impervious to the ascending gases than the center, because only the large pieces of fuel and stone roll to the center, while the ore stays about where it falls.

This tendency to burn up through the middle was, however, very much reduced by using coke as a part of the fuel. The more rapid working thus effected may have been the secret of this improvement in results.



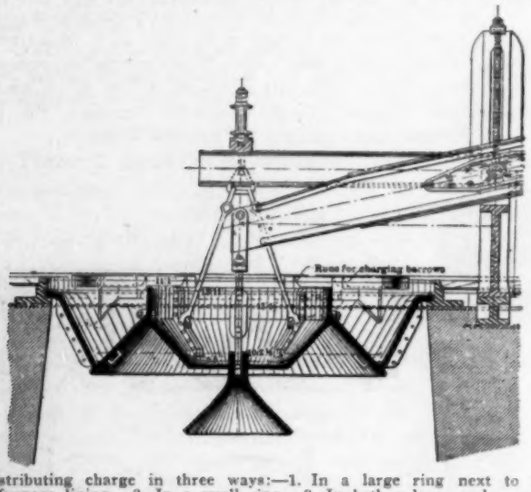
Distributing charge both in a ring next to the lining and in a heap at the center.

FIG. 5.—FIRMSTONE'S MODIFICATION OF THE BAUMAN BELL AND HOPPER.

Later, the single bell was replaced with the Bauman bell shown in Fig. 4, and afterwards Firmstone's modification of the Bauman (see Fig. 5) was added. This improved design was used a long time, and therefore, presumably, with satisfactory results at Glendon, Pa.

3. Fig. 6 represents the Durham bell, the invention of Mr. Edward Cooper, who made many interesting experiments with it. In this design the hopper on the annular bell gives control of the distribution. This was, I believe, the first device which embodied that important feature; and for this and other valuable contributions to technical progress (notably the Durham iron stove) Edward Cooper deserves the hearty thanks of American ironmasters, especially because he has always generously placed the results of his study and ingenuity at the disposal of his professional colleagues, never seeking to hinder the free use of them by protecting them with patents.

4. A charging apparatus used at Longdale furnace, Va., is



Distributing charge in three ways:—1. In a large ring next to the furnace lining. 2. In a small ring. 3. In both a large and a small ring.

FIG. 6.—THE DURHAM BELL AND HOPPER.

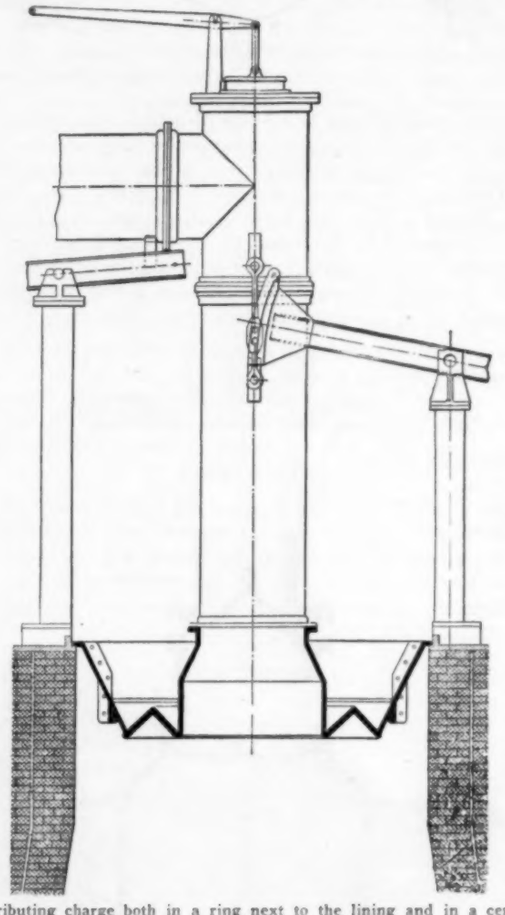
shown in Fig. 7. It is practically a Bauman-Firmstone, with provision for taking the gas off in the center—a feature which has been highly commended.

5. The double bell of the Bauman type, shown in Fig. 8, has been used by the Saucon Iron Co., N. J. It will be noticed that the Bauman bell deposits the ore in an annular ring and also in a heap in the center, while the Durham bell deposits it in a large or small annular ring, or both, according as the inner or outer hopper is used.

6. In 1887 I designed the bell shown in Fig. 9, which, by means of the suspended spreader-bell, can use to effect the same distribution as the Bauman or Durham, according as the "spreader" may be turned up or down.

This apparatus was intended to meet special conditions, particularly the coming use of Champlain magnetic concentrates, which were then as fine as Mesabi ores, besides having a higher specific gravity, and being, therefore, more inclined to run. It was under my charge for only five months, during which the furnace worked normally, and the special efficiency of the apparatus was only negatively demonstrated. As an experiment, however, the furnace was charged for about a week wholly through the inner hopper, with spreader raised, all the stock being thus put in a heap in the center. Normal work continued; but the lining came up 3 in., demonstrating, what I had expected, that by means of this apparatus the ascending gases could be diverted and controlled at will.

Mr. N. M. Langdon, a member of the institute, completed the blast with this charger; and when I saw it next, after my return from Mexico in 1888, it was lying on the stock house floor, badly burned and warped (probably in blowing out), and



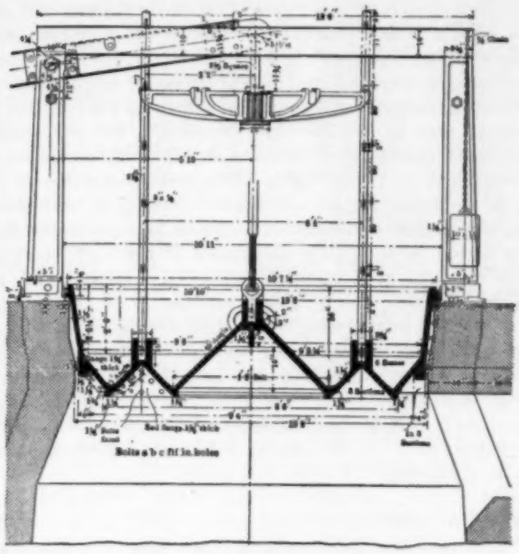
Distributing charge both in a ring next to the lining and in a central heap smaller than that shown in Fig. 8.

FIG. 7.—THE BAUMAN-FIRMSTONE BELL AND HOPPER AT THE LONGDALE FURNACE, VA.

had been replaced with a single bell. Mr. Langdon told me that he had discovered no particular difference between it and a single bell (which, perhaps, was commendation enough); but I am still of the opinion that the Bauman, the Durham, and the combination of the two as shown in Fig. 9, have some merit, at least for special cases. Some may consider them complicated as compared with a single bell; but in practice they are not so, since one valve controls their manipulation.

It is currently reported that the modern large furnaces (from 90 ft. up) have not proved very satisfactory, so far as regularity of working and fuel economy is concerned. In the West, several have been blown out, after a few weeks' run, for decapitation and other changes; and the manager of one of the largest groups of furnaces in the United States predicted that the two which his company had under construction would not surpass the stacks 85 by 18 ft. in size, except in

quantity of product. The performance of these furnaces has more than confirmed his judgment, since they have never consumed less than 2,000 lb. of fuel per ton of iron. It seems incredible that an addition of a foot or two to bosh diameter, and 15 or 20 ft. to height, should be attended with such unsatisfactory results as are reported. One of my correspondents attributes this experience to a "wandering" of the blast—which is very possible, since the conditions for such a wander-



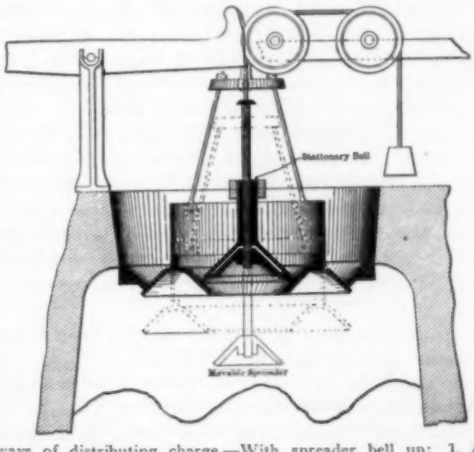
Distributing charge both in a ring next to the lining and in a heap at the center.

FIG. 8.—BAUMAN DOUBLE BELL AND HOPPER AT THE SAUCON FURNACE, N. J.

ing are provided by the (from one point of view) excessive tuyere area.

At an anthracite furnace, with blast heated to about 1,400 degrees Fahr., the tuyere pipes were, of course, generally bright red; but it was noted occasionally that only two or three of the six tuyeres were so, the others being black, showing that nearly all the blast was passing through the red hot ones. By partially closing the valves in the tuyere stocks of the hotter ones, the others could be reddened, and the blast, thereby, more evenly distributed.

Subsequently, a direct experiment showed that the volume of blast which was entering the furnace through 75 sq. in. of total tuyere area, would pass out into the open air through 30 sq. in. at the same pressure, providing that the resistance was



Five ways of distributing charge.—With spreader bell up: 1. A ring next to lining. 2. A center heap. 3. A ring next to lining and a center heap. With spreader bell down: 4. A large and a small ring. 5. A small ring.

FIG. 9.—THE WITHERBEE DOUBLE BELL AND HOPPER.

in the stock, and not in the tuyere. Probably this condition exists approximately at all blast furnaces. Many years ago, Mr. John M. Hartman invented a device to show at a glance the distribution of the blast. As I remember it, it throttled the blast at each tuyere stock, thus maintaining a slightly higher pressure in the bustle windpipe than in the furnace, so that a blast pressure gauge, applied to each tuyere below the throttling diaphragm, would show the pressure in each tuyere. If it was equal to the bustle pipe pressure, it indicated an obstruction in the zone of that particular tuyere.

While it is easy to demonstrate blast wandering, the remedy is not so apparent. Maintaining a considerably higher pressure in the bustle pipe may tend to remedy the evil; but so long as the method of charging keeps the center relatively more open, it will not be practicable to reduce the tuyere area; for, in such a case, the open center would be burned out, and the most serious of all blast furnace derangements, a ring scaffold, would be set up, with its accompanying dust throwing, slips and so-called explosions.

Perhaps any defects in working, which may have been shown by the "Jumbo" furnaces, are due, not to the size of the stacks, but to the way in which the materials, including the blast, have been distributed. If their reported fuel consumption could be brought down to the best records of the smaller furnaces, it would represent a saving of over $100,000 per annum for each furnace—a sum of sufficient importance to justify the slightly increased complication of the charging apparatus.

It will be a surprise if the monster Buffalo furnaces do not even surpass this fuel economy—not on account of any extra superheated blast that may be at their command, but by reason of their improved charging apparatus, which, to my mind, shows a step in the right direction.

It is to be understood that whatever reference has been made above to large furnaces applies to a few specific cases, reported to me, which may not be typical ones. Moreover, in these cases, fuel economy may have been sacrificed for quantity of product, as is sometimes intentionally done for good commercial reasons. The main purpose of this paper is to present the suggestion that better results in running might be had by charging nearer to the center, so as to have a more resistant column of materials there *to blow against*, thereby enabling the reduction of the tuyere area enough to minimize blast wandering and its train of evils. As the matter now stands, we are obliged to use, with large bells, tuyeres from 50 to 60 percent too large, and thus practically to surrender all control of the blast at the bustle pipe, from which it can enter the furnace through any tuyeres offering a relatively smaller resistance. I am under obligations to Messrs. Frank Firmstone, B. F. Fackenthal Jr., and David Thomas, for drawings and valuable data embodied in this paper.

The European members of the Society of Chemical Industry who came to the United States to attend their annual meeting which was held recently in New York, spent several days in Pittsburg last week, making a tour of inspection of the iron and steel plants in that district. The visitors were lavishly entertained by the members of the Pittsburg Chemical Society. On Monday, Sept. 19, electrical engineers from all parts of the world to the number of 156 were entertained by the officials of the Westinghouse Electric & Mfg. Co. The party remained only one day in Pittsburg, but all of the important departments of this company were seen by the visitors.

A meeting of the Engineers' Society of Western Pennsylvania was held at Pittsburg on Tuesday, Sept. 20. Gerald E. Flanagan read an interesting paper on the power plant installation of the Phipps Power Building, Pittsburg, which appeared in *The Iron Trade Review* on Sept. 15. A meeting of the structural section of this society will be held on Sept. 27, and on Oct. 11 the mechanical section will meet to discuss a paper by R. N. Ehrhart on "The Steam Turbine."

A meeting of citizens of Hamilton, O., was held a few days ago to receive a report from a committee appointed to investigate the possible removal of the Niles Tool Works from that city. The committee reported that the company desires to increase its shops and needs more room, which necessitates the vacation of North Second street between its shops. The report made no recommendation, but it was adopted with a resolution declaring that some way to keep the shops in the city should be found. Several other cities are offering inducements to the company.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

Fort Worth Wire Works, Fort Worth, Tex., have been incorporated with a capital of $20,000, to manufacture and sell wire mats and metal novelties. Incorporators are: J. A. Todd, R. L. Horsley, C. C. Cunningham, O. S. Lattimore and F. E. Todd.

The Page Engineering Co., Baltimore, Mr., has been incorporated with a capital of $10,000, to manufacture power machinery of every description. Incorporators are: Charles B. Page, Forrest Bramble, Clarence A. Kries, J. Walter Gunts and David B. Shultz.

The A. M. Castle Co., Chicago, Ill., has been incorporated with a capital of $100,000, to do manufacturing in iron and steel. Incorporators are: Charles M. Chamberlain, Adam Reichwein and William B. Simpson.

The Warrington Iron Works, Chicago, has been incorporated with a capital of $2,500, to manufacture machinery. Incorporators are: Charles S. Andrews, Eugene G. Fassett and Sandor Thomsen Von Colditz.

The Eastern Foundry & Machine Co., of Richland, N. J., has been incorporated with a capital of $200,000. The incorporators are: Frederick D. Hazleton, James Donald and Andrew Donald.

The Kerr & Coombes Foundry Co., of Walkerville, Ont., has been incorporated with a capital of $50,000. The provisional directors are W. J. Kerr, Geo. Coombes, W. H. Kerr and W. Coombes.

The Fort Payne Stove & Foundry Co., of Fort Payne, Ala., has been incorporated with a capital stock of $25,000. The incorporators are: B. J. Allen, W. C. D. Cook, S. B. Stone and J. B. Haralson. The company will manufacture stoves and do a general foundry business.

The Eagle Foundry Co. has been incorporated at Muncie, Ind., with a capital of $5,000. The directors are: J. D. Ross Crozier, Harley D. Hartley and Harry Rhoads.

The Brammers Foundry Co., of Ironton, O., has been incorporated with a capital of $5,000. The new company takes possession of the plant of the Ironton Foundry Co., and will do a general foundry business. The incorporators are: William Brammer, Allie W. Kerr, S. P. Humphrey, E. T. Belcher and J. C. Snyder.

The American Drill Co., Springfield, O., has been incorporated with a capital of $50,000. Incorporators are: Justice W. Sharick, Minnie Sharick, Joseph Lindman, Noah L. Heckman and Charles E. Lutz.

The Buckeye Machinery Co., Columbus, O., has been incorporated with a capital of $30,000. Incorporators are: J. A. Taft, G. W. Shartle, C. F. Andrews, C. O. Sherwood and Cyrus Huling.

The Oil Fields of Mexico Co., the New York offices of which are in No. 52 William street, is in the market for large quantities of material to be used in the development of its oil property, located in the State of Vera Cruz, Mexico. The pending purchases include nine miles of 22-pound rails, 8,000 2-in. wrought iron bolts, and three or four flat cars and other necessary equipment save sleepers, for a mule tramway, which it is proposed to build on the company's property. Two thousand feet of 2-in. cast iron pipe will also be bought within the next few days. Other orders about to be placed comprise an outfit for building two extra rigs, necessitating, among other things, two steel boilers complete.

The Virginia Foundry & Machine Co., Virginia, Minn., has been incorporated with a capital of $25,000. Incorporators are: Albert C. Osborn, Edward G. Bush and Sylvester Pollock.

The United Machine & Supply Co., New York, has been incorporated with a capital of $10,000. Directors are: Russell Hawkins, H. C. Cranz and H. C. Traute.

The Eagle Novelty Mfg. Co., Chicago, has been incorporated with a capital of $10,000, to conduct a foundry and machine shop business. Incorporators are: William W. Klein, Henry H. Handlay and John P. Chick.

The Isthmian Canal Commission has called for bids for five steam shovels on which the proposals will be opened at the office of the commission in Washington on Oct. 6. The specifications require that the shovels shall be not less than 65 nor more than 75 tons in weight. No bids will be considered for any type of shovel which has not actually had service tests in stiff clays and heavy blasted rock work. All bids must be accompanied by detailed drawings and manufacturer's standard specifications; also by a list of shovels of the same character furnished other parties and a certified record of the work actually done by them where the shovels have been used in the materials specified above. All bidders will be required to accept the responsibility for the shipment of the shovels to Culebra, Isthmus of Panama, set them up and furnish the necessary men to operate them successfully for two continuous weeks, during which time the shovels will be required to excavate and load 2,500 cubic yards solid measurement per day of ten hours for six consecutive days. The first shovel must be completed and loaded on board cars ready for shipment within 30 days after acceptance of bid.

The National Steel Fence Post Co., Cass Lake, Minn., has been incorporated with a capital of $50,000.

The United States Steel Piling Co., Chicago, has been incorporated with a capital of $500,000. Incorporators are: Frederick W. Cox, Halvan Stabell and Marshall A. Sattley.

The Morris Hardware Mfg. Co., Marion, Ind., has been incorporated with a capital of $20,000. Directors are: Charles F. Morris, C. L. W. Krause, J. N. Phenis, C. H. Holbrook and J. E. Merrill.

Fires and Accidents:—

The entire business section of the town of Idaho Falls, Idaho, was destroyed by fire Sept. 12. Among the plants destroyed was that of the Consolidated Wagon & Machine Co., whose loss is $95,000.

The foundry of Butterworth & Lowe, of Grand Rapids, Mich., was slightly damaged by fire on Sept. 7th. The fire broke out twice, but was extinguished without serious loss.

The pattern shop of Christian Anderson, of Davenport, Ia., was destroyed by fire on Sept. 7th. The patterns were damaged, some by fire and others by water.

The plant of the Greenslade Foundry Co., of Milwaukee, Wis., was damaged by fire to the extent of $4,000 on Sept. 2nd. The plant is insured for $35,000 and hence the loss is fully covered. The damage will necessitate the closing of the foundry for about a month for repairs.

The plant of the Central Iron Works, Syracuse, N. Y., was destroyed by fire Sept. 14. The loss is estimated at $50,000. The company will secure temporary headquarters and will begin at once the rebuilding of the plant.

The advantage of the installation of automatic sprinkling systems in factories was shown by the fire which occurred recently in the foundry plant of R. W. Whitehurst & Co., of Norfolk, Va. During the night a patrolman was passing the plant and hearing the sound of falling water, he called the owner and entered the foundry. As they entered they saw a few sparks fall, but upon reaching the second floor found that the fire was already out. The fire had extended over a considerable portion of the plant, but as fast as heat reached the sprinklers they went into operation and immediately put the fire out. They drenched the place completely and prevented any further spreading. The installation of the sprinklers cost $1,700.

The plant of the Buckeye Foundry Co., St. Paul, Minn., was burned Sept. 11, causing a loss of $3,000.

On the afternoon of Sept. 14 the auxiliary boiler in the rolling mill department of the Toronto Bolt & Forge Co., at Sunnyside, near Toronto, exploded, badly injuring several men and partially wrecking the building.

New Construction:—

The Lindsay Wire Weaving Co. will erect a new building at Collinwood, O. It will be one story, 35 x 185 ft.

The Lorain Steel Co. will build an addition to its plant at Johnstown, Pa. The building will be 165 x 250 ft. and will be occupied by the hammer, bolt, shear and truck shops of the company.

The Root & Van Dervoort Engineering Co., Moline, Ill., will

erect a new foundry building 100 x 150 ft., two stories, of stone, concrete and brick. The cost will be $15,000.

The Indiana Union Traction Co. has filed with the city of Anderson, Ind., a bond of $25,000 as a pledge that the company will carry out its agreement to build its central carriage shops in that city, and also to have two more interurban lines into the city within two years. The estimated cost of the shops is $150,000.

The Keystone Co., Sterling, Ill., will build an addition which will increase the floor space of its foundry 60 percent.

The Casey & Hedges Mfg. Co., Chattanooga, Tenn., will erect a new pattern shop and addition to its power plant. The pattern shop will be 50 x 125 ft. and will be equipped with machines of the latest design.

The Interstate Steel Co., Rockford, Ill., manufacturer of the Racel carbonized steel, has recently erected a building suitable for making its product, soft center steel. The building is equipped and the company will not be in the market for any machinery.

The Singer Co. has awarded a contract to Jas. Stewart & Co., of Pittsburg, for the erection of some of the buildings of its new $1,000,000 plant at St. John's, Province of Quebec, Canada. Among the buildings to be constructed are a foundry 100 x 400 ft. with two wings, one 40 x 70 and one 54 x 60, one of which is to be used as a cupola room and the other as a core room, also a foundry shed 75 x 200 ft. and pattern storage house 60 x 60 ft., together with other buildings for pattern shop, machine shops, woodworking plant, etc.

The Lorain Machine & Forge Co., of Lorain, O. expects to add a foundry to its machine and forge shops. In the past it has done repair work mostly, and now expects to manufacture certain lines in addition to the repair work.

The Union City Foundry Co., of Union City, Pa., has erected a foundry 70 x 100 ft., with a wing 50 x 90 ft. The equipment is being installed and it expects to do a general foundry business.

The Aultman & Taylor Co., of Mansfield, O., has erected a new pattern shop, which is a modern building with a steel frame.

The foundry of the Richardson & Boynton Stove Works, of Madison, N. J., is being enlarged to make room for 24 additional molders.

The Livermore Iron Works, of Livermore, Ky., is erecting a new machine shop and foundry. The company is owned by S. A. Davis & Son.

The Davies Car Wheel & Machine Co. has decided to locate its new plant at Grayslake, Ill., which city has been offering special inducements to manufacturing plants to locate there. The site secured by this company seems to have special advantages, as it has direct connection with two railroads. The company is incorporated in Illinois, with head offices in Chicago, and expects to manufacture railroad specialties, the patents for which it controls.

The steel department of the Peoria Steel & Tool Co., Peoria, Ill., will start with one 24-pot crucible furnace, four steam hammers varying in size from 500 to 1,000 pounds, one set of three-high rolls and a medium sized shear. There will be a small machine shop for keeping these machines in repair. The steel department will have two main buildings, each 60 x 105 ft.; a crucible room, 30 x 60 ft. and a warehouse, 31 x 60 ft. The tool department will consist of a foundry, 60 x 60 ft. with a 10-ton cupola; a core oven and tumbling room, 21 x 44 ft.; a pattern shop, 32 x 60 ft., and a fully equipped machine shop, 60 x 120 ft. A power house and office building will also be erected.

The Superior Machine Co., Bowling Green, O., whose plant was destroyed by fire recently, is preparing to rebuild. The company manufactures farm implements and oil well specialties.

The Kokomo Nail & Brad Co., Kokomo, Ind., is enlarging its nail department so as to increase its product 10 tons per day.

The Evansville Metal Bed Co., Evansville, Ind., is building an addition 100 x 360 ft. for the manufacture of iron beds. The company will need a new engine, two elevators and other machinery, such as shapers and possibly lathes.

The Berlin Iron & Brass Foundry Co., Berlin, N. H., is building an addition 40 x 50 ft. which will be equipped with new machinery. The first floor will be used as a machine shop and the second as a pattern shop.

The Morgan Spring Co., Worcester, Mass., will erect a new building, 72 x 115 ft., three stories and basement.

The R. E. Olds Co., Lansing, Mich., recently organized, will build a large plant for the manufacture of automobiles. The machine shop will be 70 x 700 ft., on one side of which will be three buildings, one 60 x 500 ft. and two 70 x 500 ft. The office building will be 50 x 100 ft. All of the structures will be two stories, of brick with concrete foundations.

The Addresso-Printograph Co., Elyria, O., is building a foundry and machine shop to manufacture a number of office specialties.

Preliminary plans are being prepared for the new shops which the Big Four railroad will build at Springfield, O. The plans provide for a car shop, paint shop, boiler shop and machine shop.

Although inducements have been made by other cities to have the Kiddy Boiler Works Co., Canton, O., move its plant, the company will probably remain in Canton. It will build a new plant 60 x 250 ft. three stories, with a wing 60 x 80 ft. for a foundry. The company will manufacture the Kiddy-Lloyd water tube boiler, valves, heaters, etc.

The Bessemer Gas Engine Co., Grove City, Pa., is erecting an addition 100 x 200 ft. of steel and cement, which will enable it to double its present output. The company may open a branch shop at Muncie, Ind. It already has branch shops at Lima, O.; Montpelier and Marion, Ind.; and Independence and Chanute, Kan.

The Taylor-Wilson Mfg. Co., Allegheny, Pa., whose present plant is located on Grant avenue, Allegheny, will erect an entirely new plant at McKees Rocks, Pittsburg. It will consist of a foundry, 90 x 180 ft., of steel construction and will be equipped with electric traveling cranes. The machine shop will be 100 x 160 ft. and will be built of reinforced concrete. A modern office building and pattern storage warehouse will also be erected. The plant will be located on the Pittsburg, Chartiers & Youghiogheny railroad and will be ready for occupancy about April 1.

The H. C. Frick Coke Co., Pittsburg, will have 200 of its 1,000 new ovens under construction in the Connellsville region, ready for operation, early in November. The remaining 800 will not be completed until spring.

The Goulds Mfg. Co., Seneca Falls, N. Y., manufacturer of pumps, has purchased forty acres adjoining its plant and a large addition will be built.

The Globe Machine & Foundry Co., Philadelphia, will begin on Sept. 30 the erection of a foundry 55 x 91 ft. at Cloud and Ruan streets.

A. A. Jones, Columbia, Ala., has let the contract for the erection of a brick building 30 x 70 ft., with L 20 x 40 ft., to replace machine shop recently burned.

Ground is being staked out for the rolling mill of the Fort Worth Rolling Mill Co., Fort Worth, Tex. The site consists of seventy-five acres and a large plant is to be built.

The Yerkes Observatory, which has established a branch on Mt. Wilson, is now building a machine shop in Pasadena, Cal., to be used for the purpose of manufacturing the minor instruments required at the Mt. Wilson observatory.

Owing to increased demands on the work turned out at Stratford, Ont., the Grank Trunk railway system has found it necessary to increase the present plant considerably at that point. The new buildings to be erected and the additions made to the old ones will give a total of 74,654 sq. ft. additional floor space. A large amount of new and up to date machinery is to be installed.

The Lumen Bearing Co., Buffalo, N. Y., will build a foundry at No. 1155 Sycamore street at a cost of $5,000.

General Industrial Notes:—

The Wabash Foundry, of Vincennes, Ind., which was formerly owned by Clarke & Buck, has been sold to A. B. Clarke for $7,350.

D. E. Gill, of Albany, N. Y., and Frank L. Streeter, of N. Hinsdale, N. H., have leased the Richardson foundry of Brattleboro, Vt., and expect to do a general foundry business.

Edw. J. Lambert who was foreman of the Syracuse Chilled Plow Works for 17 years, has made arrangements to open a

foundry in Syracuse, N. Y., for the manufacture of gray iron castings. He expects to employ about 60 men.

The Southern Illinois Machine & Foundry Co., of Murphysboro, Ill., has absorbed the plant of the late J. W. Lewis and increased its capital stock from $6,000 to $20,000.

Reddick, Lean & Co., Mansfield, O., have purchased the plant of the National Drill Co., Cambridge City, Ind. The new owners expect to build an addition to the plant.

The American Pig Iron Storage Warrant Co., organized under the laws of New Jersey, has been admitted to do business in Ohio, with offices at Columbus and Linn Bentley as agent.

The Etna Furnace at Ironton, O., has resumed operations, after an idleness since last July. Extensive repairs have been made while the stack was out of commission.

The shops of the Baltimore & Ohio Southwestern, at Washington, Ind., and Chilicothe, O., have begun to work on a full schedule of ten hours a day. Thirteen hundred men are benefited by the order.

The Tudor Iron Works, East St. Louis, Ill., have been closed down and the employes have been notified that it is not known when the plant will again be in operation.

Arch M. Loudon, of Abendroth Bros., Port Chester, N. Y., and N. B. Payne, of the Payne Engineering Co., Elmira, N. Y., have leased the foundry of the Payne Engineering Co., and will begin operations about Oct. 1 in iron and brass castings, as the Payne Foundry Co.

Schuchardt & Schutte, 122 Liberty street, New York, have decided to open for Cologne and its branches at Brussels, Liege, Paris, Milan and Bilbao, a new office under the firm of Alfred H. Schutte, 26 Cortlandt street. This office will be under the management of T. H. Marburg, who has been connected with the New York office of the firm for over five years and has been the New York representative of all the ten houses for the last five months. The Liberty street office will be under the management of Ernst Muller, who will represent the interests of the houses at Berlin, Vienna, Stockholm and St. Petersburg. Mr. Albert H. Schuchardt desires catalogues, price lists, etc., sent to the Cortlandt street office.

The American Corrugated Furnace Co. is the name of a new corporation, having a capital of $350,000, with headquarters in Philadelphia. The company was organized primarily for the purpose of manufacturing the Brown improved corrugated furnace, under patents owned and controlled by John A. Brown Co., Ltd., of Sheffield, England. In addition it is proposed to manufacture heavy pressed steel goods of all description, such as automobile frames, manholes, yokes, car shapes and similar work. The company has purchased the property of the Weaver-Hirsh Co., of Allentown, Pa., and will for the present, at least, equip this plant with the requisite machinery suited to its needs.

The Hub City Iron Works, of Aberdeen, S. D., started its new foundry on the first of September.

The Warren Electric Mfg. Co., Sandusky, O., has been notified that the Government has awarded it the contract for the building of $50,000 worth of turbine engines for the Boston navy yard.

The Colorado Fuel & Iron Co. has received an order for 10,000 tons of steel rails from the Colorado Midland Railway Co. and the Colorado & Southern Railway Co. The rails will weigh 85 pounds and will be used to replace 65-lb. rails.

The Blakeslee Foundry & Forge Co., Cleveland, has been awarded the contract for 2,500 tons of bolts to be used in the construction of the North river tunnel of the Pennsylvania railroad. Delivery will be begun in November and extend one year from Jan. 1, 1905. The contract was won over much competition through the zeal of J. R. Blakeslee, president of the company. This is the only contract in connection with the tunnel work which has come to a Cleveland concern.

The Portsmouth Steel Co. resumed operations last week after a short period of inactivity.

The citizens of Converse, Ind., are making an effort to raise $10,000 to get the National Car Coupler Co. to open its plant in that city. The plant has been closed for several months and the company offers to place it in operation and enlarge it if the citizens will give $5,000 and take $5,000 of stock.

The South Baltimore Steel Car & Foundry Co., Baltimore, Md., is building 500 ventilated fruit cars for the Atlantic Coast Line Railroad Co. Each car will be of 60,000 lb. capacity and will weigh 31,000 lb.

The Lennox Machine Co., Marshalltown, Ia., has begun the manufacture of safes, making a specialty of safes suitable for the use of farmers.

The Virginia Gas Co. has awarded to La Belle Iron Works the contract of supplying fifteen miles of pipe, the cost of which will be between $60,000 and $70,000.

After an idleness of some weeks, the Parkesburg Iron Works, Parkesburg, Va., has resumed work. The company has received a contract which will keep the plant busy for five months.

The Peoria Business Men's Association, of Peoria, Ill., through whose activity the Peoria Steel & Tool Co. was recently formed, is now endeavoring to organize a company for the manufacture of barbed wire. It is proposed to raise $60,000.

The Standard Chain Co. has decided to abandon the shops at St. Marys, O., on account of the cost of fuel. The machinery will be moved to Marion, Ind., and Columbus, O., where the company has plants. Gas, which was formerly plentiful at St. Marys, has given out and it has been necessary to use oil as fuel.

In competition with seven large bridge construction firms from the West, Joseph F. Cody & Sons, of Peoria, Ill., were awarded the contract for the construction of the new bridge which is to span the Illinois river at the foot of Bridge street, Peoria. The bid of the successful firm was $290,000, which was $12,000 below that of the next lowest bidder.

The rod mill of the American Steel & Wire Co., Donora, Pa., made a new production record on Saturday, Sept. 17, in one turn extending from 5 o'clock in the morning to 5 in the evening. The output amounted to 810,900 pounds, which breaks all previous records, and which no doubt will stand for some time. The best previous record for this mill was made about a week before when 776,000 pounds were rolled.

The Budke Sheet Steel Co., Canonsburg, Pa., is organizing an underlying company to be known as the Budke Stamping Co., which will consume a large portion of the output of the company's sheet mill. The incorporators of the new company are John F. Budke, William H. Paxton, George D. McNutt, George Retburg and John M. Watson.

The puddling department of the Wheeling Steel & Iron Co., Wheeling, W. Va., resumed operations this week after an extended idleness. Several weeks ago announcement was made of a proposed resumption, but the men refused to return to work until the scale was signed. The adjustment of the bar iron scale with the Republic Iron & Steel Co. enabled the company to come to an agreement with its employes for the remainder of the present scale year.

There is no truth in the widely circulated reports that the Jones & Laughlin Steel Co. will add another Bessemer department at Pittsburg. Additional Talbot furnaces are to be built, thus increasing the open-hearth steel capacity, but the location of these furnaces has nothing whatever to do with the decision reached some time ago not to build a rail mill in the near future. The officials of this company never definitely decided to make such an addition, and if conditions warrant, a rail mill may be added in the future despite the location of these furnaces in that portion of the mill reported to have been set aside for the rail department.

The Harbison-Walker Refractories Co. advises that the recent fire at Hays Works will not in any way affect deliveries on orders. No. 1 and No. 2 works were unaffected by the fire, and it will be possible to make shipments without interruption from these works. Arrangements have been made so that the friends of the Refractories company will suffer no inconvenience from this accident.

The Grant Mfg. & Machine Co., Bridgeport, Conn., recently incorporated with a capital of $50,000, has moved into its new factory building, 90 Silliman avenue, where it hopes to to be able to handle its increased business advantageously. It manufactures bench screw slotting machines, tool post grinding outfits, bench filing machines, speed lathes, multiple spindle tapping machines and special machinery to order, besides doing contract work on typewriter, car fare, cash register and envelope sealing machines and various coin controlled machinery.

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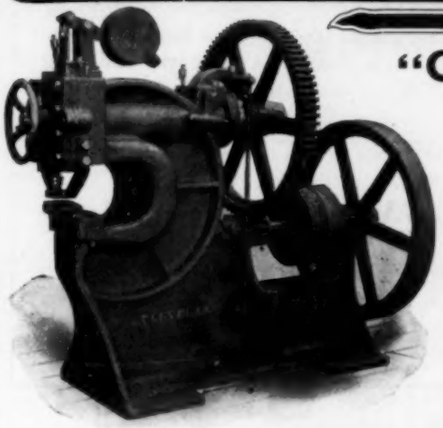

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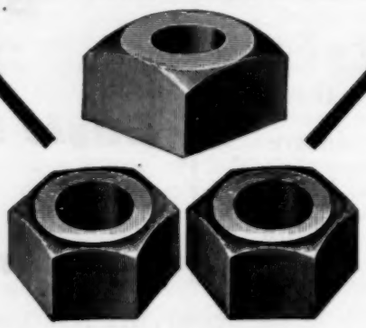

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